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The Anatomist in Medical Education*

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The establishment of a lectureship is a significant event in the intellectual life of a university; it is a particularly important episode in the life of a medical school for in medicine there is increasing need for coordination and contemplation of a rapidly advancing body of knowledge. The purpose of this new foundation in creating a lectureship "fostering greater appreciation of the study of human anatomy in relation to the teaching and practice of medicine" imposes a heavy obligation on me as the first Robert J. Terry lecturer; I am fully aware of this responsibility and of its opportunity.

The sense of honor and of trust which this lectureship places on me, is in large part due to my friendship for, and admiration of, Dr. Robert J. Terry. For in him Washington University has had for many bright years an outstanding figure in the broad field of human anatomy. With an inquiring interest into such seemingly diverse subjects as racial differences, variability in mammalian series, human constitution, skull development in the bony fish and other morphological problems, Dr. Terry has stood forth as an investigator of note, as a distinguished contributor to the great disciplines of anatomy and anthropology. But, perhaps, even more important than these additions to our body of knowledge through research, has been Dr. Terry's magnificent influence as a teacher of his own chosen subject—a teacher in the highest sense, a kindly and learned guide to a great group of eager students embarking on their life-work. To Dr. Terry I pay tribute when I express my joy that this new lectureship shall bear his name in perpetuity.

I propose to discuss the field of anatomy in its broad relation to medical education. I find it a difficult, yet exciting, undertaking—difficult because today no one seems to know exactly what anatomy is and where it is heading; and exciting because it offers the anatomist an opportunity to express, without fear of instant contradiction, his ideas of the significance of his subject in medical teaching. From the strict derivation of the word, anatomy would seem to be restricted to the cutting apart of finished total structures, but while preference is universally given to "anatomy" over the term "morphology," the subject

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matter studied by present day anatomists extends far beyond the original source of material, the body structure of man and animals. To the time honored method of investigation through dissection with scalpel, probe, scissors and forceps, the anatomist during the past century has added to his tools of trade the microscope and microtome, the incubator and culture slide, the caliper and measuring rod, the kymograph and induction coil, even the spectroscope and colorimeter. In a relatively few years, anatomy has evolved into a mother science which embraces certain well defined but overlapping subdivisions—gross human anatomy, comparative anatomy, histology and cytology, embryology, neuroanatomy, and physical anthropology. Each of these subdivisions is in itself a great field for teaching and research; in each the frontier of knowledge is today being pushed forward by the efforts of many investigators, through independent studies or through cooperation with workers in cognate sciences. In each of the subdivisions, advance is being effected—slowly in some and very rapidly in others due to acquisition of new techniques, of new weapons of attack. Today, a broadly extending academic discipline, this anatomy of medical schools has come to be one of the major biological sciences having to do with life processes as these affect the structure (and to a lesser extent, the function) of vertebrates. But with all this wide extension, anatomy still retains an essential interest in man among the primates, and the research of anatomists still has as its ultimate focus the basic structure of man.

What, then, is the anatomist of today? Certainly, the two closely allied subjects of structure and function, rudely divorced from each other as university disciplines four score or more years ago, have again come close to each other in their research undertakings. Here are two sister subjects each striving to advance the tenuous edge of knowledge, each today employing the techniques of the sister science. So one may properly inquire: "What are these subjects today? Are they true university disciplines quite distinct from one another?" The answer is that today nearly all the fundamental departmental designations within the general field of medicine are merely convenient teaching labels; that in a graded four year curriculum certain groups of the faculty must be responsible for the teaching of certain subjects. The terms "anatomy" and "physiology," then, become merely identifying marks for a teaching unit; the anatomist becomes formally a teacher of anatomy. This argument, carried a step further and possibly to its logical conclusion, was cleverly summarized by the late Professor Herbert Woollard, who defined anatomy as the subject matter on which anatomists are working.

But the extension of the thesis seems to carry one altogether too far afield. Fundamentally, in present day conduct, the anatomist may be regarded as a biologist with the primary obligation of teaching medical students the broad bases of structure of the human (and vertebrate) body. The anatomist trains himself widely in the biological and natural sciences and relies on steadily improving morphological techniques. He may follow his research inquiries into other fields but he enriches the findings by employing those procedures of morphological control which relate structure to function. The problem and its

requirements are the important factor, rather than the technique to be used, the laboratory procedure to be followed. The anatomist feels unrestricted by his academic title, by his laboratory design: he believes himself free from hampering bonds of departmental interests and training, free to follow his research by whatever techniques may be needed.

Yet even if we accept this broad liberalization of his subject, the anatomist remains vulnerable, subject to attack by those who insist that his teaching shall be practical, i.e., related to clinical needs; rather than biological, i.e., related to the broad problems of living structure as they are expressed in animal organisms. We anatomists are willing to confess that a few years ago we were assailed by our clinical friends for devoting ourselves to "white rat anatomy" rather than to applied, human anatomy. Of course, there is some basis in these strictures (we anatomists are the first to acknowledge some slight truth in the criticism). It is true that in the protected and sequestered halls of the anatomical laboratories we tend to progress away from clinical medicine. This independent growth which, at times, takes the anatomist far from the practical needs of medical training leads me to tell you of an incident which occurred in the laboratory where I have worked for a quarter of a century. Some years ago, at a time when the teaching staff was composed wholly of persons possessing the M.D. degree, one of the workers in the building fell into an open elevator shaft and broke his leg. The man was immediately surrounded by the janitorial force and teaching staff. The group stood helplessly by until the chief janitor in his wisdom said preemptorily to these graduates in medicine who were anatomists, "Why can't one of you men go for a doctor?"

But on the other side of the picture, need I refer to more than one of the recent contributions by anatomists which has already achieved far reaching importance in clinical work? Need I say more than to call to your attention the great development of knowledge which has grown out of the original observation of Stockard and Papanicolaou on the cyclic changes in the vaginal mucosa? In the course of research, these anatomists devised and used a technical method, but it was one which gave rise to the superb advance in reproductive physiology with its close clinical application—an advance of importance equal to any other in the medical or biological fields of the last quarter century.

Yet, perhaps, even with such justification for the pursuit of the biological problem for its own sake, the present-day anatomist views with too great complaisance the strictures of his clinical associates that in his teaching he is veering far away from the practical aspects of medicine. The anatomist remembers the position of his subject in the training of physicians up to a century or so ago when practically the entire basic instruction of the young physician was centered in the dissecting table. The body of biological fact was then all too small; yet out of anatomy grew physiology—at first as a young offspring, but soon, almost one hundred years ago, to become an energetic and enterprising sister subject. With the development of the autopsy technique, gross morbid anatomy came from the dissecting table, and soon assumed adolescence and adulthood as a separate university discipline. The discovery of cells through

the use of the compound microscope added its share of complications to the simple structure of medical education; histology developed in this country and on the continent as a proper activity of anatomists, while in England the sister scientists, the physiologists, took over the task of teaching microscopic anatomy.

And while the anatomist was learning to use the microscope in his exploration of normal structure, the pathologist likewise was employing the same means toward the unfolding of the disturbances of structure caused by disease. Then, too, in the fourth quarter of the last century, medicine was advanced by the discovery of the relation of certain bacteria to disease, and medical educational processes again had to accommodate themselves to a new subject in teaching. In the same period, chemistry began to make its claims on the medical curriculum and with the development of its biological aspects, still another major discipline found its place in the required work of the ever suffering medical student. And almost simultaneously, the study of *materia medica* became invigorated and altered through the introduction of chemical and physiological approaches; and a true pharmacology assembled a new mass of information, dislocating much of the old but retaining some of its classical learning. This transformation affected the medical course only slightly, but it added its own share of weight to be carried by the student.

Even with these many inroads into the curriculum, there was still plenty of time for all of the required instruction in the four year course offered by the best American medical schools at the beginning of the century. The preclinical subjects—anatomy (including histology), physiological chemistry, physiology, pharmacology and pathology (including bacteriology)—could all obtain sufficient teaching hours for leisurely study of the required subject. The reason is not hard to find. The total mass of medical information which could bear critical scientific scrutiny and which was not sheer empiricism was woefully small. A four year course leading to the degree of doctor of medicine was at that time amply long: in fact, there is an apocryphal story regarding the curriculum of the earliest years of the school with which I am connected. According to this tale, all of the instructors constituting the initial faculty in the eighteen nineties scheduled all the required hours which they could possibly employ for the teaching of medical students. The result when reduced to block form in a four year curriculum left so many unoccupied hours that the blank spaces were overwhelming. The faculty, therefore, decided not to publish the curriculum: the earliest catalogues of the school contain no real record of the course of instruction.

But how different it is today regarding the demand for required hours in the medical curriculum! We are still giving—and I believe quite properly—the degree of doctor of medicine at the end of the classical four year period. But since the turn of the century, the total body of fact in medicine has increased enormously. Clinical medicine is no longer based entirely on pathology. During the past forty years chemistry and physics, physiology all have contributed their full share to medical diagnosis, therapy and prognosis. The study of disease has broadened enormously, to become rather paradoxically an investigation of the

disturbances of physiology; of parasitism by bacteria, viruses, fungi and protozoan forms; of the biology of new growths. Here is an apparent simplification—a generalization—which increasing knowledge has brought, but the data on which the simplification is based are far more numerous and complex than were the data of a generation ago. Alongside of this development of internal medicine, the subdivisions of surgery have all undergone phenomenal growth while the so-called major medical specialties—ophthalmology, pediatrics, neurology and dermatology—have, to greater or less degree, assumed a wholly desirable importance in medical teaching. And probably most significant of all, has been the widespread appreciation of the need for psychiatric teaching throughout the medical course. Ideally in this subject the student is given instruction even in his first year and is kept in contact with the mental aspects of disease by graded courses in the last three years of the curriculum. This development, characteristic of psychiatric pedagogy of the last twenty-five years, has resulted from acceptance of the thesis that the physician's duty is to regard the ill individual as a total functioning organism, from public realization that the world faces the great problem of mental disease and public hospitalization.

These evolutionary changes, all the result of increase in the bodies of fact or of the introduction of new concepts, have all occurred within subjects included in the medical course of fifty years ago. Alone they are seemingly great enough to overburden the relatively small number of teaching hours comprised within the four years of instruction leading to the M.D. degree. Yet other developments, probably of equal importance, have taken place in recent years, and the already overcrowded curriculum of medical teaching is now being pressed to include these also. Outstanding in this group of new subjects is that of preventive medicine. Here, due to advance in knowledge of epidemiology, biostatistics and sanitation, a mass of valuable information requiring presentation to the medical student has been assembled. And closely allied to this aspect there has come realization that medicine does not cease with determination of the diagnosis and therapy: that there are social, environmental, economic factors in disease which must be included in the summary of the patient as a sick individual. Then, too, industrial medicine, of increasing significance in the expanding mechanization of the world, pushes forward as a subject of medical importance; and forensic medicine and medical genetics likewise have their many advocates. All these symbiotic growths within our medical structure add their just weight to the four year course of instruction and the end is not yet in sight. Nor do we wish the end to come: we live in a field of advancing medicine and I pray that this pressure, embarrassing as it is to medical deans and curriculum committees, will never cease.

What, then, in this welter of essential subjects of medical instruction, should be the primary aim of the medical faculties which are responsible for the arrangement and conduct of the course of study leading to the degree of doctor of medicine in four years? Today, as in the past, the chief purpose of the medical school may be stated simply: it is to train physicians in the best possible way. Immediately divergencies arise in the medical schools of the country—diver-

cies of opinion as to what constitutes the most desirable type of physician; divergencies over methods of instruction; divergencies over ideologies in curricular arrangements; divergencies over the relation of research to teaching. Just what the medical faculty does in its course of instruction is in the final analysis determined by local opportunities, by local facilities, by the quality of the faculty, and by the extent of financial support. Yet, frequently, the local factors are minimized or ignored in discussions of medical educational processes. Discussion too largely centers about the ideal set-up for the medical school and its teaching hospital. It may, perchance, be desirable to contemplate strict university control of a hospital located adjacent to, or as part of, the buildings housing the laboratories of the medical school, for no one can really question the manifold advantages of such an arrangement. But seemingly of greater importance than mere propinquity or academic control, is the administrative attitude of the hospital toward medical educational processes. Again, the local factors become preeminent and medical faculties have been quick to learn that one arrangement will serve to greatest advantage in one community and a quite different one in another. So medical schools are inevitably bound to make best use of their local assets, which vary enormously. The result is, in my opinion, most desirable as it ultimately produces medical schools of widely diverging character. The aim of all of these schools remains essentially the same—to train the best type of physician. This training is ultimately conditioned by the locality and by the financial support.

But as a paramount feature of any program leading to the training of competent physicians, the viewpoint inculcated by the faculty is of utmost significance. Those of us who have for years contemplated medical education from the administrative standpoint, are aware of one of the great dangers of present day medical education—that, is, the danger of training superb technical machines competent to practice good medicine but lacking in intellectual curiosity, in the broad culture of the humanities. Our instructional processes, if they are to be sound, must be aimed at arousing an irresistible intellectual curiosity regarding structure and function as affected by disease. Instructors and students must be alike in approaching the cadaver, the experimental animal, the sick individual—for all these must be viewed as problems to be solved in different ways, with different techniques. What we must create and encourage is the inquiring type of mind—a mind not content with present knowledge and with snap diagnoses and judgments, but viewing all things as real problems. As has been said elsewhere, our instructional processes should be such as to stimulate in every student an overwhelming desire to remain always a student. Here the blending of teaching and research, not only in the classrooms but also in the wards and laboratories, constitutes an all powerful influence in moulding the minds of medical students.

If one adopts the contention that the chief aim of medical education should be the establishment of an attitude of mind toward the study of disease, the arrangement of the course of study and the general disposition of required and optional work become matters of relative indifference. The pattern of the

curriculum is of secondary importance, even though all of us as medical teachers delight in tinkering with the schedule of required courses. With reference to this generalization, I often quote a remark made by the late Professor Halsted at the end of a long and acrimonious debate over the required course: "The only way to arrange a curriculum is to give the good teachers what they want and to take away the hours from the poor ones."

With such a concept of curricular patterns, we can view with calmness the constant reduction of required hours in courses like those in anatomy. The decrease in time allotted to anatomy seems the more striking as for many years anatomy formed almost the entire basis of preclinical instruction. For many generations anatomy had no real competitors in the struggle for the students' time. But the diminution of obligatory teaching time has been inevitable in view of the growth of knowledge in all the basic subjects of medical instruction and in view of the necessity for introduction of entirely new courses in fields unknown half a century ago. And it is interesting that with the shortened courses in the preclinical subjects, the testimony of clinical instructors is almost universal in the declaration that the students reach the clinic as well prepared as they were with longer courses. Yet, it must be confessed that the measuring rod of educational procedure is inadequate: one deals with impressions rather than with actual data.

Everywhere throughout medical schools today, there is realization that in any of the prescribed divisions of instruction the student has time merely for an initial survey of the subject matter of that branch of medical knowledge. The fund of information is too large in every one of these subjects: the student can, at best, obtain merely the biological philosophy of the subject, hardly the pertinent details. He learns in a preliminary way the manipulative procedures employed in the field for the acquisition of knowledge, but the acquirement of technical skills is postponed in this educational process to the intern-resident years, or to the years as laboratory assistant. Our four year medical course, therefore, becomes a preliminary canter across a wide and rugged field. The student acquires a general comprehension and a philosophy in each course rather than a great body of specific knowledge and a mastery of technical procedure.

The merit of this postponement of the acquirement of the technical proficiencies until the postgraduate years is that it has permitted medical teachers to devote their energies largely to presentation of biological viewpoints rather than to insistence on techniques. Here medicine has been more fortunate, or wise, than dentistry. For in American dentistry we are confronted with an art standing supreme in its international field as a health service. Dentistry is today a superb artistry but only relatively few dental practitioners or teachers are aware of the full biological implications of disease of the teeth and jaws. The dental schools of America have insisted that their students acquire in the four year curriculum all of the technical proficiency needed for immediate practice. The dental schools provide biological courses in the preclinical medical sciences for roughly one and one half years of the four year course; then, in spite of sporadic efforts at reform, the school superimposes two and one half

years of the most rigid technical discipline. No wonder that the scientific interests of the average dental student in the biological and medical aspects of his great subject do not survive. The number of dental teachers who still maintain the spirit of investigative curiosity, except as to technical method, is woefully small. The result of the development of superb techniques in dentistry has been a pulling away from medicine: dentistry has become too largely a restorative and reparative art. It has produced a technical perfection which is not being applied, and cannot be applied, to the whole population. Technical dentistry, therefore, has arrived in a blind alley: it can liberate itself as a health agency only by developing a biological viewpoint and a biological body of knowledge. To do this, the dental school should emphasize the underlying biological sciences and relegate technical training, except as to the theory of procedure, to postgraduate years. It would do well to follow medicine in its educational program.

But, perhaps, this discussion has taken us far from the function of the anatomist in medical education; I believe, however, that these considerations bring us closer to the essential problem. It is my contention that medicine is rapidly becoming more and more of a biological science. The medical course, in my opinion, is today the best, or at least one of the best, presentations of human biology that we have. The practice of medicine is still essentially an art, but alongside of this art, an appreciable body of scientific fact in human and mammalian biology has accumulated and is continuing rapidly to accumulate. As biological information relating to man is in the future assembled through the efforts of geneticists, biometrists, anthropologists, anatomists, physiologists, chemists and others, medicine will stand forth not only as a curative and preventive art, but as a great division of human biology.

And in this future medicine with its fund of knowledge in biology, the anatomist will inevitably retain the same important place in the medical curriculum and in medical education that he now occupies, not only because of historical privilege but in his own right. Under any intelligent philosophy of medical pedagogy, the anatomist will continue to teach human morphology in its widest sense; primarily a biologist—and a human biologist—he will present, even in a possibly more restricted time allotment in a four year curriculum, an essentially important phase of human biology, that of human structure, its reason, its evolution, its ontogeny, its phylogeny and, possibly, some aspects of its function. Unquestionably, it will be a larger and more soundly based subject than the gross and microscopic anatomy of today; but it will still be aimed at the disclosure of man's structure. It will be a human anatomy, biologically founded, and for it there will always be an outstanding position in the medical curriculum and in medical education.

But more than that, the anatomist with his position in the initial stages of the medical curriculum has an enviable responsibility for development of the wholly desirable attitude of intellectual curiosity in enthusiastic and impressionable medical students. Coming as they do from American colleges where, for the most part, students' minds have been stirred but little, the anatomist has

the real privilege of introducing the youth into professional education. This is a rare opportunity, and, fortunately, the American anatomist has never considered himself limited merely to his own designated field of medical instruction. He has dreamed greater dreams than this. The anatomist, being essentially the biological teacher and believing that good teaching must go hand in hand with research, has striven to cultivate a method of thought and a method of thinking. He has striven to present human anatomy as a problem in the biological sciences. The materials of anatomy, the cadaver and the microscopic section, are particularly favorable for this purpose, as the student can destroy little while he is learning the method of study, the method of investigation. So, the anatomist has labored to present a science of structure to medical students; but he has been as eager to see that the spirit of scientific curiosity is aroused in the student as he has been to check the acquisition of the so-called basic facts necessary for promotion. The anatomist is happy to present the hypotheses, the tenets, the speculations, the deductions drawn from primary data; but the anatomist is happiest when the student makes his own independent interpretations and conclusions. The anatomist, in a peculiar way, has an extraordinary opportunity of acting as an intellectual guide and not as a teacher in the ordinary sense, for in medicine teaching accounts for little. It is learning or self-education that is important for the student. In this process, the anatomist, as a human biologist, assumes even today an essential function in medical teaching; and in the generations to come it seems likely that this accessory obligation of the anatomist will increase in importance, ever progressing forward with the growth of the body of fact in the various life sciences close to medicine.

So, in the future schools of medicine, just as in our present schools, there will be anatomists who, like Dr. Terry, are students of human structure and who, like Dr. Terry, will transmit to their students inspired enthusiasm for the remarkable adaptations of our bodily structure to environmental and functional requirements. Medicine will include more and more biological science in its curriculum, and to this addition of biology the anatomist will, I predict, contribute his full share. I look forward to the subjugation of techniques and arts in medicine as a means toward an end: therapy and prevention will rest on a fundament of sound biological information. Thus in the future, as in the past, there will still be employment for the anatomist in medical education—still an opportunity for the anatomist to supervise the student's work on human structure, still the rare and priceless privilege for the anatomist to cultivate and encourage an intellectual curiosity in the medical student, and still problems requiring attack by the anatomist.

These research problems awaiting the anatomist are before us today and the field of future endeavor even now looms larger and more significant than it has in the past. While it may, in some laboratories, be unfashionable momentarily to work on the problems of gross human anatomy, this subdivision of the science still presents a multitude of questions of fundamental moment. With new viewpoints anatomists are returning to the great subject of variability in human structures, to study of racial anatomy, with comparison of structure of the negro

and yellow-brown races with the white. Such research undertakings lead quickly into the general subdivision of physical anthropology with its techniques of exact measurement and mathematical analysis. Here one finds today the anthropologist projecting into the future his important problems of human evolution and man's place among the primates, differentiation among human races, individual variation, human heredity and growth. Many of these essential problems are those of gross human anatomy so that we may look forward to joint attack by the anatomist and physical anthropologist.

And in the other subdivisions of the anatomy of medical schools, we envision similar investigative opportunities. Certain broad phases of comparative anatomy, a branch of learning which a few decades ago was devoting itself to classification of vertebrate forms, now assume renewed importance in human morphology due to work aimed largely at the significance of adaptation of structure. The profitable field from the standpoint of the medical school today is the comparative study of the primate forms, particularly the anthropoid apes; and alongside of this will proceed comparative investigations of the alteration in morphology attributable to functional needs. Such studies will ultimately furnish information needed today for the solution of the most vexatious yet vital problem—that of the mechanism of evolutionary change in structure.

But what of the other subdivisions of anatomy in the future? The nervous system, because of its highly specialized character and its great complexity, will continue to demand the concentrated attention of anatomists. Correlational studies, relating structure to function, will probably still offer the best chance of profitable return. Various mammalian forms, representing special adaptations to functional needs in nature, afford splendid material for generations of earnest research. And possibly most fruitful of all will be the investigation of the anatomical and physiological maturation of the nervous system, carried out not only in primate forms but throughout the mammalian series.

The great medical field of endocrinology, in which stupendous progress has been achieved in recent years, will continue to attract the best efforts of anatomists of diverse training and interests. To the advance of the past twenty years the anatomist has contributed a large share, and it seems most likely that in cooperative endeavors with physiologists and biochemists the anatomist will continue to add an important factor in morphological control. The potentialities of these phases of endocrine function are almost unexplored and there is much research to be carried out before adequate understanding is achieved.

In embryology, also, a tremendous opportunity lies ahead and we are today just taking the first timid steps forward in an endeavor which a few years ago would have been impossible. Due to advance in knowledge of reproductive physiology, the anatomist in recent years has been able to construct a new morphological embryology based on dated early macaque specimens; and today we are obtaining similar human material. The solution of the significant problems of implantation and early embryonic development will, therefore, add a chapter, at present wholly unknown for higher forms, to our knowledge of

human growth. Today, also, the field of chemical or physiological embryology is opening up to new endeavors, and with the recently discovered weapon of radioactive chemical substances a wholly novel aspect of embryonic development and growth will be unfolded in a generation or two. Likewise, histology and cytology are employing new means of attack on the chemical constitution of the cell. We have now the initial advances made by the lately devised methods of microincineration, of freezing drying fixation, of spectroscopic analysis, of quartz system spectrographic study with ultraviolet light, and of the electron microscope, the potentialities of which are today so largely unexplored. A great problem in itself—the internal structure of the cell—and the solution will require decades of effort by the microscopic anatomist.

These are but a few suggestions of the lines of future endeavor, but it seems obvious that the anatomist has before him a great opportunity in research of prime importance to the understanding of structure. The anatomist has had a place in medical education; he will, I believe, continue to have one of the important roles in future medical education. The influence of a teacher-investigator like Robert J. Terry has been richly felt these many years at Washington University: through his students and through his work this beneficent influence will live on. Other anatomists will, of course, in the generations to come, assume these tasks of teaching and research in human structure here in this great medical school; there will be an enthusiasm and a spiritual vigor in the work of presenting anatomy to medical students. We anatomists appreciate our duties and privileges in medical education and I venture to prophesy that the anatomist of the future will likewise cherish his obligations and his opportunities in teaching an essential subject in medicine.

The Education of a Physician*

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INTRODUCTION

Recently, the medical profession and the public have been greatly concerned with the cost and distribution of medical care. While these problems are undoubtedly of great importance, adequate medical attention still is and, under any condition of practice, always will be dependent on the training, ability and character of the physician. The practitioner is a product of his environment. He enters his professional studies with the impress of his past experiences, and he carries on his work subject to the customs and ideals of his community. Therefore, it can hardly be expected that medical standards should be uninfluenced by the activities and purposes of his surroundings. George Horace Lorimer, in his "Letters of a Self-Made Merchant to his Son" stated that the problem of education is the same as that of curing a ham. If a ham is good to start with, it will turn out to be a good ham whether it is salted or sugar cured. However, he admitted that the only way one can get any sense out of an aphorism is to turn it inside out and reverse it. This is what must be done to the ham theory of education because a good ham can be spoiled in many ways. Of course, we hope to start with good material, but it may be ruined either in the process of preparation or by a deleterious environment.

A consideration of some of our present practices in medical education and, more particularly, a follow-up of our graduates as they carry on their life's work, suggest certain improvements in undergraduate education and indicate strongly the desirability of a shift of our emphasis from the undergraduate to the postgraduate. These are the purposes of this paper. Certain features of the education of the physician will be reviewed to indicate the major deficiencies of our modern system and to offer some constructive ideas for their correction. That some of these suggestions have been considered by many medical authorities can be determined by referring to the opinions expressed in the chapter dealing with medical education in volume one of *American Medicine* and to articles published in the *JOURNAL of the Association of American Medical Colleges*.

ADMISSION CONSIDERATIONS

The education of the physician really begins with his family history and his childhood training. An analysis of these factors, while important, would be beyond the scope of this paper. Likewise, his school and premedical training cannot be dealt with here. It is evident that the applicant for admission to the medical school represents a cross section of our youth. These young people are interested in education as it is now obtainable in our colleges; they have the

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funds to pursue this; and for one reason or another wish to follow a medical career. While we try to fill the available places with individuals of the best calibre, the net result of our selection is a fair representation of our cultured community—a few brilliant; a few dull; the majority average to mediocre.

Most selection committees use four standards for admission to a medical school. In the first place, the candidate must give evidence of an adequate mental equipment, as judged by his college grades, with a full realization that colleges differ in their standards, that grades represent, for the most part, memory tests rather than wisdom, and that qualification by grades is probably necessary in the absence of better standards of fitness. Premedical grades may parallel medical school grades¹ but neither are entirely adequate evidences of suitability for the medical profession.

A second standard is good character. This can be assumed in almost all cases because of the rigid requirements from the referring college.

The third criterion of desirability is personality, or fitness for medicine. Sometimes this is gauged by the young person's extracurricular activities, by the judgment of his former teachers, by a pleasing impression, or by some interest in human beings or research during his college course. This characteristic is intangible and regardless of the experience of selection committees is most difficult to evaluate.

Finally, and of great importance, is the necessary but lamentable requirement of financial responsibility. The applicant must give evidence that he can pay his way through his four years medical course. Because of the demands of the medical school work, it is practically impossible today for the student to earn money by extracurricular endeavors. In many cases such an attempt has led to serious illness. Moreover, most schools have raised their tuition fees during the last two decades so much that many of our most competent physicians would not be able to study medicine today. A comparison of tuition fees in 71 of 73 medical schools in 1917 and 1938 shows that the average increase is 143 per cent. Forty-four of these schools have increased tuition fees from 90 to 200 per cent. The University of Illinois has actually decreased its rate 6 per cent for residents of the state but is now charging nonresidents 40 per cent more than in 1917. West Virginia has increased its fee from \$25.00 in 1917 to \$254.00 in 1938 for residents and from \$50.00 to \$404.00 for nonresidents. These latter two institutions are not included in the average increase mentioned above. Twenty-three institutions have an average yearly tuition fee between \$400 and \$500; twelve charge between \$500 and \$600, and four have a rate of \$600 or more. These figures do not mean that the medical schools have increased their fees beyond reason because in all of these institutions the cost of education per student is far in excess of the fees collected. But there can be no question about the great financial barrier which confronts the individual who wishes to study medicine.

In his annual report to the Board of Overseers, President James B. Conant of Harvard pleads for a wider financing of able students: "To limit a profes-

¹. Zapffe, F. C.: J. Assoc. Am. M. Colls. 18:381 (Sept.), 1938.

sion to the descendants of a small group in the community would not only be undesirable socially but would automatically decrease the quality of the profession by diminishing the field of selection. I think few who know the situation can doubt that the learned professions suffer because they have failed to recruit from all economic levels of society." Whether financial aid can best be given by loans or scholarships is not as important as the necessity for subsidizing the education of the competent who are not admitted to medical schools because they cannot meet the financial requirements. While many loan funds and scholarships exist for medical students, they are usually given after the student has completed some of his course and have little effect on the rejection or discouragement of indigent applicants. The objection to loans is the fact that such a system acts as a load on the student and induces him to modify his education to pay his debts. Perhaps, a loan which can be converted into a scholarship by meritorious work would be a better plan. Scholarships based on accomplishment seem, however, to be wisest. This is the greatest criticism of our present methods of selecting medical students, elimination of the fit who cannot meet the really tremendous financial demands of modern education. The remedy lies in scholarships or subsidies. It is at least as important to endow these as to erect palatial buildings or to provide laboratories or research funds; because our first concern must be with men, not things, if we are to keep the profession human. To competent men who have nobility and energy, ideas always will be available, and for the work of such individuals adequate resources will probably not only be available but will not be misused.

UNDERGRADUATE TRAINING

The undergraduate medical training is probably the strongest feature of our entire educational system. Millions have been put into buildings, laboratories, hospitals and teachers by foundations, individuals and states; and, in the main, this money has been well spent. The chief criticism which may be leveled at this expenditure is that some funds have been wasted in lavish architecture and luxurious appointments. But for the most part, undergraduate education is excellent and the problems concerned with improvement are not to make a bad situation good but a good situation better.

Some medical authorities have stated that our young graduates are influenced too much by the laboratory and fail to appreciate the human factors of disease. Such a criticism may have been valid during a short transition period of medical education fifteen or twenty years ago. These critics' contact with modern young physicians may be too one-sided. It may be that they see too much of the academic, research clinicians. Or possibly, they do not enter into intimate contact with the student during his daily clinical training. Certainly, today our students receive more practical training than they did twenty years ago. Lectures, recitations and didactic clinics have been replaced to a considerable extent by practical clerkships replete with close and responsible contact with both hospitalized and ambulatory patients. In connection with this type of learning, the social and economic aspects of the patients are studied thoroughly, aided by social service

workers and, in some cases, even by home visits. A careful survey of our present methods of clinical instruction would soon dispel any question of over-emphasis of the laboratory techniques in the modern student's approach and treatment of his patient.

The preclinical studies may be separated into three main divisions: normal structural, including anatomy, histology, and embryology; normal functional—physiology, chemistry and pharmacology; and abnormal structural and functional—pathology and bacteriology. Of course, these are not water tight compartments and many instructors in one field may be more concerned in their research with the problems of another department. A certain correlation is often attempted between these departments. The main criticism of the preclinical instruction is the overlapping of subjects and the waste of time resulting from unnecessary repetition. This is especially true in the functional subjects. The physiologist emphasizes the process influenced by the drug and the pharmacologist stresses the drug which affects the same process. Many things taught by the biochemist are repeated by the physiologist. While there may be a certain value in repetition the reason for these separate courses is probably due to the tradition surrounding the origin of the subjects. There is every reason for the maintenance of as many divisions as necessary for research work but as far as undergraduate instruction is concerned, there can be no objection, except our inertia against change, for a unification of all preclinical courses into three groups,—normal structural, normal functional and abnormal structural and functional.

As stated previously, the clinical training of the undergraduate medical students has been changed greatly in the last fifteen or twenty years. Instead of several hours of recitations and theoretical lectures, clinical training has taken the form of clerkships and conferences. The large amphitheatre clinics, where the student saw the patient at a distance and listened to the oratory of a professor, have given way to intimate discussion of cases worked up by the undergraduate. There can be no question about the advantages of modern clinical pedagogy. The chief criticism of clerkships is based on the fact that the allotment of the student's time is often gauged by hospital needs or traditional departmental divisions rather than by the educational advantages offered.

The most important foundation of the average future physician's training is methods of diagnosis, the principles underlying disease and the treatment of illness. These disciplines can best be given by general medicine. The important fields of general surgery, surgical and medical specialties and gynecology can be used for such training also, but in most hospitals these latter subjects form a group designed to teach some of the therapeutic applications of general medicine. The real training of the surgeon, gynecologist, obstetrician, allergist or dermatologist must, of necessity, take place after the student has graduated. Therefore, the undergraduate should learn the principles of these applied specialties rather than be used as one of the cogs in the machine of a busy service. Of course, the average student is thrilled by doing things and some of this mechanical work is good training, but unless he is given the leisure to read and think and

the opportunity to discuss his activities, observations and ideas with his instructors, much of this activity degenerates into mere "Brownian movement." It leads nowhere. The question must, therefore, be raised whether too large blocks of time are not given in the undergraduate curriculum of most of the medical schools to the specialties which include surgery, gynecology and obstetrics. Certainly, it would be well to determine how much of this time is used advantageously by the student for his training and how much contributes to free hospital labor. The educator must always guard against emphasizing specialization to the student for nothing is worse in medicine than losing sight of the patient as a whole, that he is not a group of organs but an entire human being. It is for this reason that the development of strong special departments, jealous of their privileges, is a bad example to the student, and, in fact, to the entire profession.

One of the greatest advances in clinical instruction in recent years is the care of ambulatory patients in the clinic. This type of work given to the medical student is a close approach to the actual practice of medicine. It is much more difficult than ward duties, and, therefore, the student is promoted to the outpatient department in his senior year in most medical schools. Therefore, it seems logical that the instructors assigned to this field should be senior men. In many institutions this is not the case. The senior men enjoy the ease of ward instruction, with the cases well prepared, and the preponderance of well advanced lesions. Outpatient work is performed by junior instructors, as a rule. Tradition makes it difficult to change this. The outpatient department was used, and still is in many hospitals, to obtain material for the wards. Promotion is from the outpatient to the inpatient department. Such need not be the case. In many English hospitals seniority in rank is signified by the conduction of an outpatient clinic. The objection of busy practitioners to a certain waste of time in outpatient work, even in well run appointment clinics, cannot be denied. But the advantages of difficult problems and intimate contact with senior students should recompense the older men for teaching in the outpatient department. Certainly, this type of work will not yield its maximum return to the students until the senior instructors partake in it.

A suggestion was once made by a well known medical educator that it might be a good idea to reverse our medical course by teaching the clinical subjects during the first two years and then give the preclinical sciences the last two years. Then the students would first learn *how* disease occurs and be in a better position to understand *why* in the latter half of their undergraduate studies. Such a plan is, of course, extreme, but it has the germ of an excellent idea and that is to give the clinical students an opportunity to go back to the laboratory for intensive work in connection with the cases. A modification of this plan has been tried by Professor Leathes of Sheffield who shortened his physiological course, thus giving the students an opportunity to enter their clinical work sooner. In return for this, the clinical students returned to the physiological laboratory once a week throughout their undergraduate course. As

a result the students thought physiologically while they were working with patients and, too, they were freed from the misconception that a subject was completed when a course was finished. Probably, the ideal undergraduate curriculum would consist of preliminary, short, elementary preclinical courses, and then combined clinical and intensive laboratory work. Under such a plan, while the student is working up his cardiac patient he is going back to the various scientific laboratories to study various subjects suggested by the patient. While the rate of acquisition of knowledge might be slow at first, in the end not only would a faster tempo be acquired but what the student learns would have a real significance and a more permanent value than at present. Whether such a scheme would be too costly or impractical cannot be predicted, but that it is desirable is suggested by the many correlation courses between preclinical and clinical departments.

A word might be said, in passing, about public health instruction. Most students feel that they are not attracted by this field after they have finished their undergraduate training. The weakness of the present method of teaching this subject is the absence of responsibility and practical application in the average institution. At Harvard, each student has a field problem for two weeks. This is a good beginning. But public health instruction needs an adequate clerkship, just as other clinical courses, and until such an opportunity is offered, undergraduate instruction in public health will fail to appeal to students.

POSTGRADUATE EDUCATION

If a physician is asked where he obtained his best training, he almost invariably responds "as an intern," "as a resident," or "in practice." It is remarkable, with all our investment of money, time and well equipped personnel in medical schools that these latter institutions are not given more credit by the physicians for their training. No one can question the importance of undergraduate training as the basis on which graduate instruction and experience are acquired. But, if so much stress is placed on the physician's development after graduation, it is highly desirable to examine the opportunities offered for postgraduate training, to compare them with undergraduate facilities, and to determine whether the physician's continued education is adequate in view of the practical problems surrounding the practice of medicine.

Few who are acquainted with modern medicine would contradict the statement that in view of the importance of the maintenance of the practitioner's training the facilities for this are grossly inadequate when compared to the funds, effort and experienced teachers which are allotted to the undergraduate's education. This does not mean that too much is given to the undergraduate. On the contrary, more can be used to advantage by the medical schools. Nor does it imply that physicians attached to non-teaching hospitals are essentially less capable of imparting knowledge to their juniors than are medical school instructors. But, as a rule, medical schools and their hospitals attract men interested in teaching and give them the training and some leisure to develop as educators.

INTERNSHIPS AND RESIDENCIES

That hospital internships and residencies offer excellent opportunities for training is due often to the initiative of the house officer rather than to the conscious efforts of the hospitals. In fact, often education in such an institution might be termed extracurricular. The demands of a modern hospital from its staff for routine work and the necessity for organized care of the patient, as opposed to individual study, often makes the education of the intern a secondary factor, even on university services. But in spite of these unavoidable deficiencies, most medical men serving in good hospitals never learn better methods or more facts in a shorter time than during their services as interns or residents. National bodies such as the Council on Medical Education and Hospitals of the American Medical Association, and the American College of Surgeons, and local organizations, such as the New York Committee on the Study of Hospital Internships and Residencies, have studied and graded hospitals for their educational opportunities, and, as a result, considerable effort has been made to improve this feature of hospital service. However, certain aspects of hospital training still may be bettered. In assigning duties to the house officers, the needs of the hospital usually take precedence over the educational opportunities of the interns. This cannot be avoided entirely and, in spite of it, facilities for development are numerous. But unless some individual has on his conscience the future of the resident staff, material and time may be wasted which could be used for teaching purposes.

The chief criticism of many intern services is their failure to train men for what they will probably do in the future. In one New England city, for example, a recent survey showed that only one-third of all the physicians who received surgical training as interns and residents were practicing surgery. The remainder were practicing general medicine without adequate preliminary hospital training. The reason for this is obvious. Modern surgical practice requires many house officers as aides, but offers opportunities for relatively few visiting surgeons. The same is true of most specialties which today often require hospitals for the care of patients as contrasted with general medicine or pediatrics. The most practical solution under the present state of demands made on hospitals is to afford all interns a good basic training in general medicine in addition to any specialty service. This would make a better house officer for the specialty. It might be added that some training in surgery and the other specialties would improve a medical internship. For the man going into general practice, therefore, a mixed internship, with a considerable proportion of his time spent in medicine, would seem to be an ideal service. This does not mean a short term rotating training in which an individual spends only two or three months in each specialty. Such a training is pernicious and, unfortunately, has received encouragement from the licensing boards of certain states. Nor can one say that the so-called straight services, with their prolonged and intensive training, are not the most desirable, provided the intern has the time and means to supplement his service in special fields in which he expects to practice.

Another shortcoming of some institutions in their opportunities for training is the relative lack of proper outpatient instruction. This is being corrected by many hospitals but there is still a tendency, in many cases, to ignore the fact that the type of patient with whom the practitioner spends most of his life and for whom he needs a great deal of education is not the hospitalized but the ambulatory patient. As yet, the majority of hospitals have not allotted adequate time to the intern or sufficient supervision of his work in the outpatient departments. But in spite of room for improvement, the internship offers more to physicians than they will ever acquire in a similar period of time and undoubtedly are the happiest years of their professional lives.

THE CONTINUED EDUCATION OF A PHYSICIAN

So far the education of the physician in the medical school and the hospital has been discussed and the opinion has been expressed that, in general, this is probably as good as can be expected from the types of institutions under the present standards of education and resources of the various communities of our country. But, there is general agreement that the continued education of the physician after he leaves the hospital is by contrast markedly defective. The seriousness of this deficiency should cause considerable concern not only because most patients are under the care of the practicing physicians but because the good work of the schools and hospitals can be undone by failure to keep abreast with modern medicine; and deterioration of a professional man is certain and rapid in the absence of stimulation from his environment.

It is often depressing to the medical educator to follow up his handiwork. He finds, as he is called to speak before various medical societies or in consultation, some of his former students of ability whose practice and knowledge show little evidence of their original promise. And, as a rule, the explanation is usually the same—stern competition, economic demands, absence of adequate educational facilities.

The inability or failure of medical men to continue their education intensively does not necessarily mean that they are not keeping abreast with new essentials. Society meetings, publications, and, for better or worse, pharmaceutical advertisements afford a certain amount of information. But this is sporadic, unorganized, and not always of the highest order. If one believes that after a physician leaves the hospital he has learnt everything he needs, then, of course, the present status of postgraduate education need not concern us. But even if modern discoveries did not render many standards of medical practice obsolete in a short time, it would be essential to refresh and to restimulate the active practitioner to keep him as alert and as efficient as the young physician during his hospital days.

The urgency of this problem can be seen by recent comments in the *Journal of the American Medical Association*. For example, in the issue of January 15, 1938, an editorial deals with the activities of The Commonwealth Fund in establishing rural community hospitals to attract well trained physicians and in

providing scholarships at various medical schools for young men who will agree to practice for a term of years in rural communities. Undoubtedly, this is splendid even though only a limited area can be affected. The provision that this plan affords an organization through which relations can be maintained with consultants in large teaching centers is probably the most important feature of the plan, because these young physicians become old and come under the influence of their community. It is not difficult to obtain good services for a community by providing competent physicians starting to practice and establishing well equipped institutions for the community with adequate funds. The problem which presents difficulties is to maintain these good standards and to provide them for an adequate number of our population. No one who understands the relationship of patient needs to care desires to provide all communities with the luxuries of medicine. But it is apparent that there is still much to do before we have the necessities of medicine in all localities remembering that the term necessity must vary in its meaning in different regions.

An editorial in the Journal of the American Medical Association of February 19, 1938, entitled "The Development of Graduate Medical Education," gives an excellent summary of what has been done in this field by this Association and its constituent organizations. The first survey was made in 1915. In 1923, an inspection by the Council on Medical Education and Hospitals noted that extension courses of lectures and clinics were being given by at least four universities, and that seven medical schools, three graduate schools and an infirmary were giving satisfactory courses for practising physicians or complete courses in one or more of the specialties. By January, 1937, thirty-four state societies were offering some form of systematic graduate instruction in which colleges, state health departments, social security administrators and Foundations were cooperating. This editorial also points out that while nearly every state association offered some form of graduate education at a central location, efforts were being made in about three-fourths of the states to carry instruction to all sections of each state.

That this latter attempt was far from adequate is suggested by President-elect Upham's statement that the Council on Medical Education and Hospitals might study the possibilities of traveling postgraduate courses with the hope of bringing modern medical developments to practitioners living in the more isolated areas of the country. There are many reasons for considering methods of diffusing modern medical knowledge and the best ideals of medicine beyond centers of education and practice. In the first place, only a small percentage of practitioners can afford to leave their duties for any length of time because of finances and the constant demands of their patients. In the second place many of the physicians who do go to centers of education are interested in becoming specialists and their postgraduate education contributes little to the improvement of general medical practice. Moreover, while lectures and clinics are valuable, this type of instruction does not meet the needs of the practitioner in aiding him with the problems which go on from day to day in his own community. Adequate graduate instruction must include widespread education in all localities where

medicine is practiced and must consist of living with the problems, not sporadic visits. It might be argued that such an ideal is impossible, but the U. S. Public Health Service has been able to reach almost all regions of states with its traveling demonstrations. The problem is really one of organization. How far we are from attaining this aim can be ascertained by reviewing some of the field study reports being published in the Journal of the American Medical Association Organization Section.

While the various state and local organization are giving many physicians the opportunity of attending lectures, courses and clinics, the majority of physicians are not receiving postgraduate instruction even of this sporadic or entertainment type. At the Annual Conference of Secretaries of Constituent State Medical Associations,² Dr. Walter F. Donaldson, referring to Pennsylvania, stated: "Our big problem is the thousand or more physicians scattered around in some of the more remote counties who cannot take the time or afford the money to come to medical centers to receive this type of education." He also said: "We are beginning to witness the tragedy that happens to elderly practitioners who make no endeavor and who have nothing brought to them to keep up in competition with the well prepared younger men who are now locating in these more or less remote districts . . ." He might also have described the tragedy that happens to the patients of these elderly practitioners. At the same conference, Dr. Warnshuis said: "We were not reaching the men who should be reached, either because they did not want to come or because of the difficulties that were encountered in attending a meeting." Dr. T. W. M. Long³ summarized the problem for North Carolina, and his conclusions are worthy of reiteration because they have universal applicability: "If postgraduate instruction is to reach most of the physicians; it must be carried to them . . . The clinical demonstrations are given on diseases and conditions existing in the physician's own community, and the problems of his everyday work are thus dealt with. He sees modern diagnostic procedures applied at home and the patient sees them and learns to appreciate and to demand careful, systematic examinations, thus raising the whole standard of medical practice in the community."

The present lecture method to local societies is a good deal like our old fashioned didactic teaching to undergraduates. We have improved undergraduate instruction considerably by giving the student the responsibility for the care of the patient under supervision. To modernize postgraduate education, we must permit the practitioner to deal with his own problems in his own community with the aid and service of his instructor who is conveniently available. The erection of postgraduate institutions may be necessary for the training of specialists but not for the continued education of the general practitioner. Bringing the educator to the practitioner may involve considerable expenditure, but not nearly as much as building and equipping institutes, and, what is more important, local education would mean that the invested money would yield more permanent results. Effective education implies that the teacher is not only

². J.A.M.A., Jan. 29, 1938 (Feb. 5), 1938.

³. J.A.M.A., Jan. 29, 1938.

present to pass judgment on the case but remains to see the results of his advice and partakes in the follow-up work. This means that the instructor must stay with his pupil for an adequate time.

It might be objected that such a postgraduate plan which brings the instructor to the physician, even into remote areas, and keeps him there for a week or even a month is impossible of attainment. If sufficient funds could be obtained, this idea could certainly be put into practice. It involves nothing more or less than missionary education and would certainly require less expenditure than attempting to bring the practitioner to an institution or central location. As a matter of fact, the germ of such a comprehensive plan is already planted. Throughout the country visiting clinics and demonstrations are being held by county societies, medical schools, public health organizations and Foundations. All that is necessary, is an extension, which can be made possible by subsidy and organization.

If an attempt is made to develop this plan from some central body, it will meet too much opposition to be effective. Good education predicates willingness on the part of the student. The educator must be invited, not forced on the pupil. The practical solution of postgraduate education probably rests with individual communities, such as the states or groups of states. Perhaps, in some instances, groups of counties can organize the work best. Nor is it necessary to have one type of organization. In some states the state medical society can serve as the prime mover; in others, a university medical school; in certain cities the academy of medicine; in rural communities, the local hospital. The Medical Society of the State of New Jersey has shown how medical associations, medical schools, universities, hospitals and public health organizations can cooperate to offer educational facilities to the physician. In time, various groups may wish to establish a central organization of postgraduate training for mutual help and exchange of ideas. But this should be a natural development.

The essential problem is to realize that funds given for medical education can be utilized in no better way than by the organization of a visiting post-graduate plan. An intensive trial in one state would certainly be an educational experiment worthy of interested philanthropy or the treasury of a medical society. The details of expenditure should be left to the local group. In some states, it may be necessary to supplement the budget of universities or hospitals for borrowing their men. In other localities, the student practitioner may have to be enticed by a subsidy. Such methods are being tried now and can be modified or expanded to develop a more comprehensive plan.

CONCLUSION

The education of a physician is a complicated procedure and should last throughout his life. For effective education money is necessary, certainly for the subsidy of indigent students and for the continuation of proper training of the practitioner. But before funds can be solicited, we must determine our objectives and have some general idea of how we should attain these objectives.

There can be no question in the minds of most medical men that our investment of time, talent and treasure for postgraduate education is entirely inadequate if compared to that available for undergraduate training—if the relative importance of these two phases of education are considered. Medical schools do a good job, by and large. But the environment often spoils the product of undergraduate education. The effects of the environment can be offset by the proper type of missionary education in the field. As the American Medical Association and the American College of Surgeons have elevated the standards of hospitals, so organizations of this type, in cooperation with other agencies, can affect a decided improvement in postgraduate education. The problem must be solved, and that adequately, if we are to sustain the effectiveness of our preliminary medical training.

"Why I Teach"

Because I would be young in soul and mind
 Though years must pass and age my life constrains,
 And I have found no way to lag behind
 The fleeting years, save by the magic chain
 That binds me, youthful, to the youth I love,
 I teach.

Because I would be wise, and wisdom find
 From millions gone before whose torch I pass,
 Still burning bright to light the paths that wind
 So steep and rugged, for each lad and lass
 Slow climbing to the unrevealed above,
 I teach.

Because in passing on the living flame,
 That ever brighter burns the ages through,
 I have done service that is worth the name
 Can I but say "The flame of knowledge grew
 A little brighter in the hands I taught,"
 I teach.

Because I know that when life's end I reach
 And thence pass through the gates so wide and deep
 To what I do not know, save what men TEACH
 That the remembrance of me will keep
 Is what I've done; and what I have is naught,
 I teach.

Louis Burton Woodward

Opportunity and Responsibility*

LANGLEY PORTER

Dean and Professor of Medicine, University of California Medical School
San Francisco, California

As I see it, the young physician comes to the threshold of his career to meet a wide range of rich opportunities; opportunity to prevent disease, to relieve pain and distress and anguish; opportunity to advance his profession by improving the way that he meets his own problems; opportunity to educate individuals and the community about what medicine is and what it has to offer, about its value and its limitations; opportunity to help elevate the standards of practice; opportunity to help perfect the art of medicine; opportunity to bring and to apply new knowledge personally through consultation with his confreres or as assistant to his colleagues; opportunity of citizenship and of leadership, such as can come only to the educated, trained, and ethically minded man; opportunity to found a family and give it an effective life; opportunity through such a family to pass on high standards and so help to strengthen the social order of the future; opportunity to be unselfish and self-sacrificing; opportunity to work and sweat and suffer and grouch and grumble without losing the faith, hope and charity that has made our profession the truly glorious thing it is. The same faith, hope and charity will help carry each of you over the tough spots, the agonies, the exhaustions, the rebellions, the dark hours that come to every man, to the physician above all others.

The gateway to every opportunity is a responsibility, and it is responsibility, rather than opportunity, that I would emphasize. First, let me give you a glimpse of the financial and practice problems inherent in the subject. Looking over the statistical information available, one sees that there is a great gulf fixed between the amount of valuable services that medicine has to offer the community and those that the people receive. It is evident that immense sums of money are paid out by the community, a large part of which constitute ridiculous or vicious expenditure.

In a study of these matters, you will find that there are obvious community health needs which are not met. You will find that the methods of practice and the modes of organization of medical services are faulty in that they do not distribute what medicine produces effectively and economically. This is a special instance of the fundamental weakness of modern society which is in difficulties not because of overproduction but because of inability to distribute what is produced, not to speak of what should be produced. You will see that well-trained, level headed, industrious, ethically minded young men, like yourselves, coming from a generation unwarped by outworn social traditions, have here an opportunity.

*Regular student course on "The Art, Ethics and Business of Medicine."

Yes, certainly, if you have a sound sentiment of kindliness, without sentimentiality, and a clear-eyed view of social welfare, you have unbounded opportunity to give abundant new life to the profession that accepts you, and great social profit to the state that has invested upward of ten thousand dollars for each of you with the hope that a healthier, happier California will justify that investment.

Like all men whose noses are held to the grindstone, the range of your vision is narrowed. Practice, you will find, is not in the least like the clock-work routine of the medical school's laboratories, clinics and wards.

Out there in the world it is "buyer's option." You have not only to treat patients, you have to be friends with them—all of them; and all kinds of people become patients. Their views of you, of your importance and of what is to be expected of you differ, often profoundly, from your own. Sometimes they will exaggerate, more often they will minimize your worth.

The belief in magic is ineradicable in human nature. The individual clings to the fetish; and that fetish may be a pretty label on a bottle, a nasty flavor, an x-ray film, a book from Boylston Street in Boston, a handsome young doctor, or a smooth and unctuous old one.

For the beginner in practice, that human weakness constitutes a deep and deadly pitfall. It is so easy by insincerity and pretense to build yourself into such a fetish. It is doubly hard not to do this sort of thing because some patients are resentful if you rob them of the right to worship at your shrine. Patients who come to you want not diagnosis, not scientific care: they want comfort, they want to be relieved of this discomfort and discontent. Many of them suffer from what has been aptly termed "pathological solicitude." Such people do not understand the limitations of medical knowledge, nor can they overcome the idea that the doctor should have no limitation and should be omniscient. Too many doctors share the popular belief that disease plus remedy equals cure, ignoring the truth preached by Hippocrates that nature does all the healing. The doctor is able only to lighten some of the handicaps healing Nature encounters. It is such distorted points of view that make it easy for the doctor to sell himself rather than his skill and to become an exploiter of the neurotic.

Here is the problem; here is your opportunity. Your responsibility is to help meet the community's need for better service. How can you do it?

First of all, realize that, as yet, you are handicapped in understanding the problems of practice; handicapped by virtue of the very excellence of your training here. The medical school is forced to concentrate on the study of acute diseases which threaten life, diseases which are quickly remediable or quickly fatal. This concentration is necessary. Patients with acute diseases must come to the hospital and it is important that students should be trained intensively in their care because the time element is so important, and the men going out into practice must be so taught that they can immediately and promptly bring to the acutely sick those measures necessary to their alleviation. But the handicap under which you suffer becomes greater because under these essential conditions

of training the student is apt to get an idea that in practice the proportional demands on his time by patients suffering from acute and chronic diseases will be the same. Now you must know everything possible about measures available to save the lives of those threatened suddenly, and such knowledge depends on just this sort of training. However, if you get to thinking of chronic diseases as being uninteresting, or if your training makes you impatient or bored with those who suffer, or even those who believe they suffer from long drawn out or often recurring illnesses, then you will fail in the functions of the practitioner.

Here, in this medical school, we try to leave with you the idea of the patient as a person; to encourage you to discover all his problems, pathologic, psychologic, social and economic. All things which enter the picture and influence the sick must be weighed if medical service is to be of real use.

There is no point in diagnosis without prognosis; none in prognosis without therapeusis, and therapy is futile if the patient cannot afford the things prescribed, or if the cost of the prescription makes such inroads on the budget that food is skimped, perhaps to the point of malnutrition; nor can there be any possible profit to the patient in drugs and physical care if psychologic stresses in the family or in the school or at the work place are wearing him down with worry. A clear view of all these things and of their implications to the patient is the young doctor's responsibility.

When you take up your practice independently or, as an assistant, from the start, and as long as you live, you have obligations which in reality are opportunities: first, to your patients; second, to your community; third, to your profession; fourth, to your family, and last, but not least, to yourself.

To your community you owe every effort and sacrifice that will promote the public health and the prevention of disease. This is one of the opportunities the young doctor has which enables him to carry the values of modern medical science into community life. To this end not the least of your responsibilities is that of cooperating with the health officer. You must be scrupulous in making reports. It is shocking to know how little attention many practitioners pay to the making of prompt, complete and accurate reports, such as the health officer needs and must have for the protection of public health and the prevention of communicable diseases. Birth and death certificates are tardily filled, and then often only because of the fear of prosecution. It is likewise so with the reports of more spectacular maladies, such as measles, diphtheria and scarlatina. But for whooping-cough, scabies, syphilis and gonorrhea, reports are more often honored in the breach than in the observance.

Here is an opportunity not only to improve conditions by doing an obvious, if arduous, duty promptly, but also a chance to train careless, ignorant or antagonistic citizens to understand and to respect fully the values of public health protection, and to impress on everyone in the community that the best interests of the community cannot be consummated unless all the efforts of the health officers have the active support of every citizen.

After all, for the present, probably always, and certainly during the life-

time of most of you, the family will be the social unit; and for all purposes of practice the unit that must receive the medical man's care and consideration. The physician once was the "family doctor," then he became the "general practitioner." Today, it is fashionable to say that "specialism" has abolished his function; that the family doctor is no longer needed. That is not true. Most of the so-called specialists are trying to fulfill some of the family doctor's functions, and doing it badly. Were it true, certainly the community would suffer irreparably. It suffers now because the erroneous new view is so widely spread that many patients, making their own diagnosis, run to specialists of their own choosing. And after examinations, perforce limited to that specialist's own field, and after paying specialists' fees, which often they cannot afford, they find themselves unrelieved. Very many times they learn that their trouble is not discoverable nor treatable in that specialist's suite of offices, so then they go to another specialist. And this experience may repeat itself from office to office until by a process of elimination patients find, if lucky, the right help, or get well under the healing hand of Time. This vice is one of the major factors in delaying effective treatment, prolonging illness, and increasing the cost of medical care, a cost which may be a burden even to the well-to-do and often is a disaster to a person of moderate means.

This is not an indictment of specialism. Specialism has done great things for medicine as an art and to reveal the scientific basis on which that art is founded. But, of necessity, the real specialist is deeply entrenched in his own narrow field. By no means always does the Scientist give time or much thought to the personality of the patient, to the emotional, social and economic conditions that surround the sick man; nor even to the pathologic complications that occur in bodily regions far removed from the narrow realms in which he is expert and is believed to be authoritative. It is for this reason that the family physician is and always will be the keyman, whenever and wherever medicine is well practiced, practiced in the best interest of patients and of the community.

Names and titles seem to carry undue weight in our scheme of things. "Specialist" is a title given privilege and authority, and monetary recognition which sometimes is excessive.

Perhaps we need a new category of "specialists" to take up the duties of the old "general practitioner": "health adviser," might be a justly descriptive title. What such a one needs is to be, in reality, an administrator to the family of all available technical health services. How these technical aides have grown in number and value, and how independent many of them have become of the doctor! They expect to engage in their work with the physician not as ancillaries, but as independents. This has come to be especially true of nurses.

Nurses, pharmacists, dentists, dietitians, physiotherapists, psychotherapists, radiologists, laboratory workers, and, most important of all, the various medical and surgical specialists must, all of them, serve the health needs of individuals and families; but they should serve only as introduced and guided by a physician of the sort we have named the "health adviser."

The man in practice, if he is able to administer this array of services, can bring most of the preventive and healing values of modern medicine to his patients. But he must be honest to the marrow. He must know his own powers and particularly his own limitations. He must know his patient, and his patient's needs, personality, weaknesses and peculiarities.

Not only must he be able to bring an accomplished specialist to aid his patient, but he must be certain that that accomplished specialist is the one best suited by temperament to understand the patient's personality. He must be certain that the specialist is a man of such integrity that the patient is safe in his hands; safe from any sort of exploitation, financial or otherwise, and at the same time that his humanity is such that he can bring kindly reassurance to the family beset by the stress of illness and the fear of bereavement. To develop such a service in practice is truly an opportunity for the young doctor, and a major responsibility as well.

Living and breathing the atmosphere of the hospital, day by day, as you must, you are surrounded by members of the faculty and hospital staffs, all of them skilled in the various technics of their specialty fields. This influence tends to develop in you the sense of inadequacy and incompetence. Quite wrongly, I think, it makes young graduates feel that there is very little they can or should undertake unassisted or undirected. It was not by this sort of spirit that advances in the arts and the sciences were made possible, nor will that sort of spirit help to make future progress possible. It is wrong for men to feel that there is little they can do legitimately for themselves: to feel that most of the patients they will see in practice sooner or later must be referred to one specialist or another. This is far from a just estimate. Not more than 10 per cent of the patients you see will need to be sent into the hospital, and not more than one-half of these will have maladies, surgical in nature, or be of a character to demand the experience and special skill of men who limit their fields of work.

Specialist consultation you will need, probably often, in your early years. Your conscience and a just knowledge of your own limitations, or your own preferences, will cause you to refer patients.

If you are good enough to graduate, unless you have deceived us and the State Board, you will be able to give adequate care to at least 75 per cent of the sick who seek your aid; and as you accumulate added experience, wisdom and heightened skill, within a few years the proportion should rise to between 85 and 90 per cent. But never forget the obligation that is on you to be prepared in emergency, with the right specialist, not to take care of your patient but to help you to do that job which, after all, is yours because the responsibility for that human being is yours. You cannot shift that responsibility by calling in a consultant, nor by referring a patient, not for a minute. If the man you choose is incompetent, careless or dishonest, and your patient dies, when he should not, or is crippled, the responsibility still is yours, and all your life you will know it, even if no one else does.

The opportunity to serve your patients and your own best interest very often turns on the word "promptly" and what that word really means in medical practice. Opportunity to save a life may turn on the immediate recognition of some condition that threatens the sufferer: acute inflammation in the abdomen, obstruction, hidden hemorrhages, obstetric emergencies, cardiac crises, diphtheria and countless other situations. Quick recognition and promptly applied therapeusis may easily mean a life saved.

Do not forget that any contact with a patient whose life is threatened (unless medical care is already being given) makes you responsible for that patient's care, not only legally, but, more importantly, morally responsible. Even if the notification is only a telephone call and you cannot go, you are bound to see that some competent physician arrives to care for the sick person, and that, with the very least possible delay. Not only is it your duty, it is your opportunity to bring the art of your profession to help save a life. Your telephone should never be unguarded. Business reasons dictate that, but they are the least of reasons. A suffering human being may need help and, prince or pauper, the ethics of medicine and of humanity demand that you should be ready to do all that you can and that you should do it at once when the call comes.

Some Saturday and Sunday you will literally "sweat blood" trying to get a consultant or a laboratory report that stands between a patient and death or disability. Therefore, when you are out of touch, you must always provide some one as a replacement. That some one should be competent and have your confidence. To be out of touch, from time to time, is necessary if you are to have the repose which is your due. Repose can be gained only if you free yourself, from time to time, from the daily pressure. Only in this way can you keep yourself fit to meet your responsibilities to your family, your health, your mind and spirit, and to take full advantage of your opportunities.

Your call list of competent nurses should always be active. There is nothing more important than to be able promptly to place the right nurse with a patient seriously ill. To depend on an agency to send you any one, some one unknown to you or to the agency, is unjust to your patient. The nurse must be able to work well with you, able to do the kind of good nursing that would satisfy you if your wife or child were the patient. Nothing less can be tolerated by a conscientious doctor. On the list of nurses should be a visiting nurse to teach mothers of poor families how to give nursing care to the sick.

That such things are difficult to accomplish adds another opportunity for the young physician and increases his responsibility to see that wrong situations are righted.

A further handicap to the student training to become a practitioner is found in a very necessary atmosphere of investigation and research which must be maintained if new knowledge is to enlighten teaching as it should. The effective technic for the development of facts and for the revelation of knowledge is a very different technic from that which is necessary when we have to apply

knowledge, old and new, to the alleviation of suffering and to the amelioration of the patient's ills.

It is a human weakness, but a very regrettable weakness, that too often in university clinics and hospital wards, the technic for the revelation of knowledge is used when what is necessary is the technic of its application. This error works hardships, sometimes disaster, on patients. After all, technical excellence is a high and desirable aim. However, if it were not a higher and greater aim to improve human happiness and welfare, there would be no point or reason in the development of surgical and medical technic, no matter how acutely conceived nor how brilliantly performed.

Time runs short. Others to speak in this course of talks will deal with the subject of office organization, but I would like to point out the opportunity there is for the young man in practice to organize measures of preventive medicine in his office, measures applicable to families, to individuals and to groups, and the personal advantage to the young doctor of doing this on a set fee basis.

Of course, unless the office is attractive, spotless and cheerful, and unless the doctor and the nurse are friendly, courteous, patient and willing to listen even to bores and to the loquacious, a practice cannot grow. And if these considerations are neglected, the organization of special services, preventive or curative, will be vain.

However, in every office there should be such specially organized office clinics as prenatal, well baby, preschool, school child, adolescent, family and periodic examinations. These are modern developments that offer opportunities for the doctor to do better work, make it easier for him to guide and to satisfy many people, to widen acquaintance, to assure essential health information to fellow citizens, and to increase his own income. Beyond this it enables him to protect himself against trivial unnecessary calls on his time, paid or unpaid.

In the tranquil atmosphere that such services develop, the doctor's understanding of the character and constitution of the patient is improved, and a world of vitally useful information is gained from those who are well. This information will be invaluable to them and to the physician when these same people fall ill and have to be treated.

Under the stress of threatened bereavement, the strain of long continued illness engendered by uncertainty and fear, some families will want consultation. Some even will want to change doctors. This is their right. No doctor should permit himself to believe that he has any vested interest in any one of his patients. Such emergencies, unpleasant as they may be for him, offer him the responsibility to facilitate consultation or change, and to see that these are done in the best and kindest way. This responsibility is also an opportunity to serve the profession, to testify to its unselfish ethics, and to impress on the family the worth and dignity of a profession whose first interest is adequate care given in a kindly way to the sick and suffering.

Research and Medical Education*

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This paper is the outcome of an informal meeting with the Detroit Medical Club, a society of scientifically minded practicing physicians who gather periodically in the interest of the advancement of medical science and of good fellowship, and who practice the gentle art—at times not so gentle—of thinking. The discussion centered about several questions, the most important of which are embodied in this report.

IS THE MEDICAL CURRICULUM A DISCIPLINE IN THE SCIENTIFIC METHOD?

This question was introduced with a great deal of apology because it is generally assumed that medical education does have a primary concern with the scientific method. Certain observations, which may be quite easily confirmed, tend to cast some doubt on this assumption. First, it is only the occasional student who can concisely and adequately define a controlled scientific experiment. This is true despite the great amount of training in laboratory methods to which he is exposed. The really great medical classic, *Introduction to the Study of Experimental Medicine*, is seldom read by present day medical students. No better statement of the scientific method has been printed since Claude Bernard, the founder of modern medicine, wrote this illuminating analysis in 1865.

The fact that some physicians are willing to accept the suggestions of salesmen for pharmaceutical and biological supply houses indicates that they, at least, do not understand the first principles of the scientific approach to medical problems. This is not to contend that the representatives of our great medical supply houses do not perform a valuable function in bringing to the attention of busy practitioners the results of recent therapeutic advances. Too few physicians, however, evince a healthy skepticism toward relatively untried therapeutic agents.

Such observations as these make it pertinent to inquire what constitutes the medical curriculum. As the usual undergraduate curriculum is organized, it aims, first, to present the known facts about the human being in health and disease, by didactic methods and by repetition of laboratory experiments and clinical observations which aim to illustrate the subject matter of the course. Many of the experiments are of little practical value in clinical medicine. In their defense it is alleged that they constitute good discipline in the scientific method. The question can be raised fairly whether the performance (repetition) of an experiment, however important, actually trains the student in the scientific method. Certainly, it is a rare experience to see a student show the enthusiasm

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which must have animated the investigator who first performed the experiment in question. One notes, however, increased emphasis on laboratory methods which relate to observations on the student himself. Much of physiological chemistry and physiology, and even of anatomy, is now being taught with the student himself as subject. This is, perhaps, the most encouraging sign that we are actually making some effort to develop a truly scientific viewpoint.

Some schools encourage independent experimentation by promising students under supervision. To have to attack a problem in this way is the nearest the medical curriculum comes to the type of discipline which is required of all candidates for the degree of doctor of philosophy in biological or medical science. (Candidates for this doctorate either learn the scientific method and produce a creditable piece of work or they do not earn the degree.)

Somewhere in the medical curriculum there should be time for every student to gratify his curiosity and exercise his creative instincts in setting up an hypothesis on a medical problem which has attracted his interest and putting the hypothesis to an experimental test. It is not important and, indeed, not likely that he will make a worth while contribution to medical knowledge. What is important is that he learns from first hand experience what constitutes a controlled scientific experiment and how logical conclusions may be drawn from his observations.

All normal children are endowed with a lively curiosity and some degree of creative instinct, qualities which all too frequently become dulled through lack of appropriate and timely stimulus. If these fundamental instincts were fostered and developed in the preprofessional educational system, there would be no problem in continuing their development and exercise at the professional levels of education. For too long we have compared students largely in terms of what they can remember at examinations and given the honors to those who remember the most. It is encouraging that newer examination methods attempt to determine how well the student can think with the facts he has learned.

The second broad objective of the medical curriculum is to develop the students' powers of observation, thought and judgment. This, in some degree, is exemplified in every course. Usually, it has the dominant emphasis in physical diagnosis. Certainly, here the success of the student depends almost entirely on the development of those essential qualities.

Finally, and importantly, it is the third broad objective of the medical curriculum to provide training in the art of medicine—the art of bringing science, comfort and, as often as possible, healing to the patient. Since our concern here is primarily with the scientific method, it is sufficient to observe that if we do not select and train students who by reason of their character, personality, self-reliance, initiative, resourcefulness, honesty and integrity are able to make effective use of their disciplined intelligence at the bedside of the patient, the whole of the vast body of medical knowledge lies fallow.

Increasing emphasis is being given to training in the preventive, social, in-

dustrial and economic environmental factors in disease; recognizing that ward teaching, by the very unnaturalness of its environment, does not provide adequate opportunity for the student to appreciate the impact of environmental forces which have crippled the individual. The science and art of medicine have been largely concerned with the diagnosis and treatment of the disease entity. We are becoming more and more interested in the environmental factors of disease and the struggle of the individual to maintain his mastery over the environment. When the patient is confined to his bed, this is evidence that he has temporarily at least, lost the battle. Modern medical education is increasingly concerned with why and how he lost and to a less degree with the wounds incurred.

The internship and residency periods of training are largely concerned with the art of the practice of medicine with, after the first year, increased attention to the more specialized techniques and skills of diagnosis and treatment. There is general recognition that more time must be made available at the residency-fellowship level for studies in medical science. If the undergraduate student is adequately trained in the scientific method and has some enthusiasm for it, he will regard the opportunities for the internship and residency as something more than merely an apprenticeship for practice.

CAN A GREAT INVESTIGATOR ALSO BE A GOOD TEACHER?

Without fear of successful contradiction, it can be stated that most great investigators are at heart teachers. It remains only for the individual and the administration to discover at what levels and in what circumstances his teaching can be made effective. What is sometimes regarded as teaching is the old lecture system which calls for special aptitudes of an histrionic character. The research individual, in his own environment, and not under handicap of the lecture rostrum, can always teach. Most scientists are too modest to exploit their knowledge for anyone who does not seek it out. Intelligent students, really interested in science and not in "spoon feeding," will search out the individual who is forging ahead. Teaching is reciprocal. The subtle flattery involved in the student-teacher relationship, when it is on an informal basis, is a great stimulus to the scientist. There is something of the "missionary" in most scientists for they realize that they have the responsibility for instilling ideas, viewpoints and knowledge into the individual who has shown that he is receptive. The modification of the lecture system in favor of conferences, seminars and small section teaching has largely solved the teaching problem of the research minded person. This is not to say that some individuals do not have a greater flair for stimulating the interest of students and dramatizing what they wish to teach. There is no substitute for the master clinician and teacher in medical education. He it is who combs the literature, synthesizes the knowledge he gains, conducts clinical investigation and to an increasing degree uses the facilities of the laboratory, practices his art at the bedside and in the consulting room and, finally, inspires the student with a zeal for learning and high scientific achievement.

IS IT POSSIBLE TO BE A GOOD TEACHER AND NOT BE AN INQUIRING SCIENTIST?

Occasionally one meets teachers who are highly regarded by students and yet do not evince much curiosity in attempting to advance the boundaries of knowledge. It is doubtful, however, that such individuals can be truly good teachers for the reason that they are concerned almost entirely with presenting facts as static material. Since facts keep no better than fish, it is doubtful if such a teacher is capable of instilling the viewpoint that useful knowledge is dynamic and that the question mark looms large in any situation. The ideal combination is the individual who presents the facts in an orderly, logical array and indicates the best accepted method of dealing with the situation at hand and then attempts to indicate the frontiers. This last step is a very important one in medical education, since by it we attempt to develop the scientific approach. The most important by-product of this viewpoint is that the student learns that he must remain a student throughout his professional life. There would be no problem of postgraduate medical education if every graduate had developed the attitude of the scientist. In such an ideal situation, the motivation for post-graduate study would come from the physician and not from medical societies and universities.

DOES THE POLICY ON PROMOTIONS SOMETIMES PLACE TOO MUCH PRESSURE ON INVESTIGATORS?

With the great progress that has been made in medical science, undoubtedly there has been a tendency to emphasize research productivity in point of numbers of published articles as an important criterion for appointment and promotion. There is growing appreciation of the fact, however, that real contributions are few and that a lifetime of work may be necessary for a single important advance. A better balanced attitude toward qualifications for appointment and promotion is developing which emphasizes the appraisal of the individual's worth to the institution in his total contribution. This should result in improved quality and decreased quantity (numbers of published articles) with, perhaps, a welcome lessening of strain on the editors of scientific journals.

The problem of publication of medical research is becoming more and more critical just as it is in other scientific fields. A multiplicity of contributions crowd periodicals with highly specialized factual data. Such material is difficult for investigators not working in the immediate field to assimilate. There appears to be need for more critical reviews and other correlating methods which will make knowledge in one field more readily available to another. Many of the advances in fundamental experimental fields which have a direct bearing on clinical practice are not readily available to clinicians. A free interchange of facts and ideas and ready access by the clinician to the laboratory will help to bridge this gap.

IS THERE NEED FOR MORE COOPERATION AMONG EXPERTS WHO ARE DOING RESEARCH?

It is commonplace to say that progress in medical science, as in other fields, has become more and more dependent on cooperation among experts. Clinicians,

for example, are endeavoring to mobilize facilities and methods which have been developed in the preclinical scientific laboratories in their attacks on clinical problems. In such offensives, the expert advice of the chemist, physicist and physiologist are employed. This is a well-recognized trend in modern research. It is not so well recognized that most such cooperative studies grow out of the interest and initiative of one individual who in studying some problem finds that he needs expert advice and help. If he is located in a school or institute where such consultations are easily available, he is able to make further progress. Sometimes the relationship goes much further and the consultant becomes a collaborator in the experiment. We should not lose sight of the fact, however, that in practically all such instances one individual has supplied the initiative and imaginative approach which was necessary to identify the problem, frame an hypothesis and work out a program of attack. People who are active investigators know that committees for cooperative research set up for the purpose of initiating and guiding research programs usually fail of their objective. The whole spirit of science is contrary to any degree of supervision and control. The administration should function only to aid in the essential business of promoting contacts and free discussion and of providing necessary funds and facilities.

IS CLINICAL INVESTIGATION A FULLY MATURED SCIENTIFIC FIELD OF RESEARCH?

There is evidence that the scientific method is being applied with greater accuracy and effectiveness to clinical problems. The clinical investigator who sets up adequate controls and appraises his results critically is making a scientific study of clinical results as they actually exist. He is, therefore, concerned with an accurate study of the effect of his methods on the patient. Research in this field requires high scientific ability. Unfortunately, it is often conducted by individuals who do not understand the scientific method and cannot, therefore, become sufficiently disinterested and objective in viewpoint to make their studies of very great value. One can think of numerous examples of controlled clinical investigation which have done away with unscientific clinical practices. As a result of such experiences, clinicians are more careful to institute controlled studies of new agents and methods in therapy. The day of successful cure in a "series" of one or two cases is drawing to a close. The scientific method is invading the field of clinical investigation and we may look for further great advances.

IS THERE NEED FOR MORE RESEARCH IN MEDICAL SOCIOLOGY AND ECONOMICS?

Many years ago, Sir Francis Bacon observed that "The contemplation of things as they are—without substitution or imposture—without error or confusion—is in itself a nobler thing than a whole harvest of inventions." This viewpoint is even more important in our times. Everyone knows that the benefits of modern science do not accrue to all people. It is trite to say that there is a large gap between what is known and what is applied for the benefit of the community. The sciences of sociology and economics are not exact, but sufficient progress is being made by survey, publicity and educational

techniques to indicate that there is hope for the future. The chain of communication between the individual citizen in need of medical care and the agencies which are available to supply such care does not operate smoothly and requires study. Undoubtedly, such contacts and avenues of information and communication as are now available are not sufficiently well-known, nor are they, in some instances, efficiently and intelligently administered. With the increased interest of governmental and voluntary agencies of various kinds in the problem of making medical care more readily available, we will see more efficient mechanisms for a medical service which will reach a greater proportion of people. As Bacon suggests, the study of things as they are is in many senses nobler than research at the frontiers of knowledge, for by such study one gets a picture of what actually occurs and one is forced to face facts as they are and not as they may be imagined.

CONCLUSION

It is safe to generalize that if every student admitted to the medical school is well endowed with powers of observation, thought and judgment and whose native curiosity and creative instincts are unimpaired, we need have little concern about the medical curriculum, providing only that adequate opportunities are available for the student to exercise these powers on medical problems under intelligent supervision.

A seasoned woodsman once advised an amateur camper, who was greatly overloaded with equipment and supplies, to empty his duffel bag and separate its contents into three piles—the first pile to include those things which he used every day, the second, those things which he used fairly often, and the third, those things which he used only occasionally. He then suggested that the last two piles be thrown away. In short, our woodsman was advising the tenderfoot to travel light and live off the land. Perhaps, we could not give better advice to medical students. If we can train our students in the scientific method as their primary tool for attacking medical problems, and inculcate by example something of the difficult and personal art of medical practice, we may be reasonably certain that we have accomplished all that is humanly possible with the medical curriculum.

Correlation of Accomplishment in Arts College with Accomplishment in Freshman Class in Medical College

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This study of correlation of accomplishment in arts college and in the first year of medicine has been made for the past five years. While the results are what is predictable, one fact stands out, viz., that fewer of the lower third students are being accepted by medical schools. Only 19.3 per cent of the whole freshman class consisted of lower third arts college students; 40.3 per cent of middle and 40.3 per cent of upper third students.

That this selection is justified is again demonstrated by the accomplishment of the students in each group. Furthermore, the figures given of the accomplishment of the lower third group supports the contention that if none of that group were accepted, the percentage of failures of the class as a whole would be reduced considerably, and comparatively few students, who succeed in justifying their acceptance, would be deprived of the opportunity to satisfy their ambition to become physicians. Only 8.4 per cent of the lower third students reached the upper third in medical school; 41.4 per cent, or nearly one-half the number, remained in the lower third; 25.6 per cent were in the middle third. Out of a total of about 1,100 students who were in the lower third in the arts college, about 88 reached the upper third; about 250 reached the middle third and about 850 remained in the lower third. Refusing admission to this lower third group would reduce the total number of medical students and raise the degree of accomplishment of the whole class considerably.

Virtually no chances are taken with the upper third group as more than one-half remained in the upper third; 29.7 per cent fell to the middle third and 14.0 per cent dropped to the lower third. It may be said that 81.4 per cent of this group made good in medical school.

The middle third group is somewhat of a problem group, as might be expected. Although less than one-fifth of that group reached the upper third, 39.1 per cent remained in the middle group; 31.7 per cent fell into the lower third group. Thus, 57.3 per cent, more than one-half, did acceptable work in medical college.

The record of failures, that is, failure of promotion, in each group, is a real index for prediction for each group. Whereas, only 2.5 per cent of the upper group failed, and 8.3 per cent of the middle group, 21.6 per cent of the lower third group failed, twice as many as for both upper and middle groups. These figures, compared with the figures for previous years, show that there are fewer failures in each of the three groups for 1937-1938, indicating that better selection of students is being made each year. However,

failures in the upper third group never exceeded 3 per cent; failures in the lower third group have been as high as 30 per cent. The middle third group remains fairly stationary, although there is a slight drop.

Occasionally, students are reported as having withdrawn, no reason for the withdrawal being given in many cases. Students do withdraw because of illness, for family reasons, for lack of finances, dislike for medicine, a desire to return to college for further study, but some doubtless withdraw because of poor work. Some of these return and repeat and do well; others fail. Therefore, it is not possible to make definite statements as to whether or not they should be included in the failures. Perhaps, they should be so included. The figures given in the accompanying chart show that there is a difference in the percentage of withdrawals in each of the three groups, a gradual increase from upper to lower third.

Correlation of Accomplishment in Arts College with Accomplishment in Freshman Year in Medical College

Standing in Arts College	Standing in Medical College			Failed	Withdrew
	Upper	Middle	Lower		
Upper	51.7%	29.7%	14.0%	2.5%	2.1%
Middle	18.2%	39.1%	31.7%	8.3%	2.7%
Lower	8.4%	25.6%	41.4%	21.6%	3.0%

Inasmuch as scholarship in the arts college is probably the major basis for acceptance of students by medical colleges, it is evident that as great care should be exercised in the acceptance of lower third students as is exercised in the acceptance of students who have less than three years of college work and whose accomplishment is quite on a par with the accomplishment of three and four year students—degree men.

Teaching of "Living Anatomy"

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It is significant that anatomy derives its name from "cutting apart." A useful knowledge of body structure, of form and relations of the various organs can only be acquired by careful and detailed dissection, completely exposing and isolating the essential parts and removing layer by layer. It is indispensable that the student becomes familiar through actual dissection with every structure of the body. Only a first hand knowledge based on such practical work enables proper visualization and shapes mental pictures which can be carried over to the examination of the living body. For the medical student the chief aim of the anatomic training is, as it were, to make the human body transparent.

This practical work is painstaking and the laboratory course in dissection requires at least from 260 to 300 hours to attain this purpose.

The necessary use of preserved cadavers has several inherent disadvantages. Preserving fluids and postmortem changes alter the normal consistency and color and, in lesser degree, affect also the shapes of some organs. Useful information cannot be acquired as to the normal aspect of mucous membranes and body cavities.

Regardless of these limitations, the basic knowledge to be obtained by cadaver dissection is an essential requisite. It is a fallacy to assume that such knowledge can be gained or that incomplete knowledge can be improved markedly by studying structural relations in necropsies or operations which afford opportunities of fresh or living dissections with normal color and consistency. A necropsy must be completed in a few hours and usually involves only thoracic and abdominal cavities. The dissecting methods used in necropsies are obviously not compatible with any careful and detailed anatomic study. In operations it is the aim of the surgeon to expose as little of the anatomic structures as possible and to keep most of the region operated on under sterile covers. The onlooking student must already have a sufficient anatomic knowledge to be able to follow and to understand the relations of the few visible structures.

In recent years, there have been many complaints that the living human subject is neglected in the teaching of gross anatomy. Although these complaints may have some justification, much of this criticism has little foundation and must be considered as being an exaggeration. Two factors have a part in it. The growing intellectual and cultural crisis of our period reflects itself in a more restless mental attitude of the students, with a certain loss of training for thorough work and an increasing inclination toward more superficial, imperfectly comprehended notions. Many students would like to reap before sowing or, at least, before giving the seeds a chance to mature. Such students wish to approach the living body or, in fact, the patient without realizing that it is necessary to have, first, a sufficient understanding of body structure.

On the other hand, some teachers, professors or instructors may be motivated in their denunciation of conservative methods in the teaching of anatomy as much by a subconscious urge to be progressive and modern as by objective reasoning. There is a tendency to overemphasize the importance "living anatomy" could at its best have in the entire anatomy curriculum.

If a total of 350 hours be allotted for the teaching of gross anatomy in the first year, of which 85 would be used for lectures and conferences and 265 for dissection, the total time profitably spent on "living anatomy" could hardly exceed from 12 to 15 hours. As microscopic anatomy, embryology and neuroanatomy must be included in the anatomy curriculum, a grand total of about 630 first year hours is obtained of which from 12 to 15 could be devoted to "living anatomy."

The urge for "living anatomy" sometimes brings merely discussions on functional relations containing few facts and only rather vague statements. Anatomy is, primarily, dissection, and it is hardly possible to dissect the living body. No matter how much the living body is inspected and palpated it will not reveal the courses of nerves and blood vessels, the structure of articulations, the exact origin and insertion of muscles, the form relations of the viscera.

In a most stimulating paper on the place of living anatomy in medical schools¹ Dean Carey makes the following statement:

"If an automobile mechanic's knowledge were to be purely descriptive, and consisted solely in pulling the parts of the automobile asunder and classifying them, and if this knowledge were not extended to the art of his profession manifested by assembling those parts together into a moving mechanism, the driver of the stalled automobile would find little use for this type of mechanic. Such a mechanic's knowledge would be purely static, analytic and not dynamic and synthetic. The majority of medical students leave the anatomy department with this type of analytic knowledge but it should be extended further by becoming synthetic."

To this a conservative teacher of anatomy might well reply that no medical student is supposed to leave the anatomy course as a physician. The knowledge of the "moving mechanism" must be supplied by the physiology and biochemistry courses and the "assembling" by a long curriculum of clinical studies, not to mention pathology, bacteriology and pharmacology.

Most experienced teachers always emphasize the living aspect in their courses of anatomy, discussing function, practical applications, surface markings and roentgenograms. Radical advocates of living anatomy often direct their attacks against a rather imaginary type of hack teacher possibly belonging to a past period but now practically extinct or at least very rare.

"Living anatomy" can be understood to comprise the following subdivisions:

1. Inspection and palpation of the normal living body in order to study the external shape of parts and to recognize surface landmarks. Drawing the

1. Bull. Assoc. Am. M. Colls., Jan. 1928.

surface outlines of internal organs with a skin pencil with the aid of percussion. Study of function with the aid of movements carried out by the examiner as well as actively by the subject. Study of respiratory and circulatory systems by auscultation.

2. Fluoroscopic demonstration of bones and articulations in action and of thoracic organs, the digestive tract, using contrast meals. Use of roentgenograms.

3. Demonstration of sense organs and body cavities with the aid of reflected light or special devices (eye, ear, nose, oral cavity, larynx, vagina, bladder, rectum).

4. Study and demonstration of nerve functions.

All these subdivisions of living anatomy have already their place in the medical curriculum. Part 1 is included in the courses on physical diagnosis and physiology; part 2 in the course on roentgenology, part 3 in the various special clinical courses, part 4 in the course on neurologic diagnosis.

At the Woman's Medical College of Pennsylvania physical diagnosis and roentgenology are taught in the second year. There would, however, be a certain justification in bringing some of these subjects into the first year. The work in dissection is often hard and unpleasant for the student, especially as some of the cadavers may not always show an ideal condition of preservation. The inclusion of living demonstrations would stimulate the interest, offer a diversion and form a bridge between first and second year courses.

The obstacles in the way of such a special course are limitation of time, difficulties of organization and increased cost. The time allowed for the study of actual structures and architectures is already very limited. It would be unwise to curtail it more. The material used presents some difficulties. It is not advisable or possible to have the students volunteer for the purpose of demonstration on the living body. It is, therefore, necessary to obtain the cooperation of ambulant hospital patients or to hire artist's models available in cities having art schools.

Cooperation with the physiology and neurology department is necessary in order to have use of an instrument for the electrical stimulation of muscles and superficial nerves. Four hours would be required for the following schedule: A one hour demonstration of the upper extremity and shoulder girdle (including electrical stimulation); one hour for demonstration of lower extremity (including electrical stimulation); two hours for demonstration of trunk and head surface anatomy and movements, including percussion of internal organs (heart, lungs, liver, spleen) and drawing of surface outlines with a skin pencil.

For a teaching of roentgen-ray anatomy, correlated with the first year course, an independent roentgen-ray equipment for the department of anatomy is indispensable. Such an addition to the anatomy department is highly desirable and has already proved to be most useful for teaching as well as for research in many of the larger medical schools.

For this course (part 2 of living anatomy), the students are divided into groups. One student of each group may volunteer for fluoroscopic demonstration and will be taken into the next group as observer. Four sessions may be provided: (a) upper extremity and shoulder girdle movements; (b) lower extremity; (c) thorax; (d) intestinal tract (with contrast meals).

The experience of many years gained in various schools has shown that with proper care and adequate technique no risks are involved.

The demonstration of body cavities in reflected light (part 3) presents certain difficulties. Special instruments not used in the department of anatomy are required. Some time would also be lost with the teaching of technique which can hardly be a part of the anatomy course. However, with the cooperation of the department of otolaryngology and ophthalmology, two hours could be spent to give the students a glimpse of living oral cavity, nasal cavity, larynx, ear drum, retina. In this case the students could take turns volunteering as objects of demonstration. The cooperation of some patients might also be obtained.

The use and demonstration with the cystoscope, rectoscope, vaginal speculum and bronchoscope must be left entirely with the respective clinics.

Demonstration of function of the nervous system (part 4) can be arranged in cooperation with the neurology clinic. At the Woman's Medical College of Pennsylvania introductory conferences, held at the Philadelphia General Hospital for first and second year students, have proven very useful. These conferences, held by a neurologist in cooperation with the departments of anatomy and physiology, helped to demonstrate much of the material covered by the first year course in neuroanatomy. A motion picture covering the same material is also used for further discussion and demonstration in the course of neuroanatomy.

SUMMARY

To summarize, it can be stated that many of the subjects some advocates of "living anatomy" wish to give in a special course are already presented in the routine teaching of anatomy by competent teachers.

The work ordinarily not included in the regular anatomy course (examination of the living body, fluoroscopic demonstrations, examination of body cavities, etc., with reflected light) is always carried out in the introductory clinical courses. There is no necessity to add such a "living anatomy" course to the first year anatomy course.

Special demonstrations during the first year, as outlined above, would, however, be stimulating and helpful. Such demonstrations in the form of the tentatively outlined course of "living anatomy" should be recommended, provided, that they could be arranged without undue strain on the departments concerned. The addition of an independent roentgen-ray equipment to the department of anatomy is highly desirable.

The Responsibilities of a State University in Medical Education*

REGINALD FITZ

Professor of Medicine, Boston University and Director of the Evans Memorial for Clinical Research and Preventive Medicine
Boston, Massachusetts

I am deeply honored at receiving an invitation to deliver today a public address before the members of the House of Representatives of the State of South Carolina. I thank you for the opportunity thus presented to me to express my views on a topic which I believe is of vital importance to everyone concerned with the general problems of public health. My subject deals with the responsibilities of a state university in medical education.

I feel peculiarly at home in Columbia because for many years South Carolina and Massachusetts have been linked together by ties of friendship, and for the past one hundred years, at least, South Carolina medicine and New England medicine have looked on one another with mutual respect. Your Joseph Winthrop, who came to Charleston in 1783, was a New Englander and a lineal descendant of our first governor, John Winthrop. Your Samuel Gilman was a son of Harvard and wrote the song "Fair Harvard" for which all the University's alumni are everlastingly grateful. In science, your Agassiz is equally ours; your Holbrook received his early education at Brown; your Shephard we claim as a Harvard student. Today, Harvard still remembers with satisfaction that Benet of Columbia, Boone and Regan of Charleston, Gray of Spartanburg, and White of Greenville are graduates of her medical school.

Thus it is that as a Bostonian visiting South Carolina I feel that I am not wholly among strangers. Rather, I feel at once that I am among friends who have, with me, a good deal in the way of a common background, common ideals, and common interests. I can speak freely.

The situation in South Carolina is of especial medical interest. The state has a population of about 2,000,000. There are approximately 1,350 doctors. Thus the ration of doctors to population here is about one doctor to fourteen hundred people, a figure considerably lower than is maintained in almost every other part of the country.

In a democracy like the United States, every man, woman and child has the right to the best possible medical care in case of illness. While it is not known how many doctors per unit of population are required to combat illness most effectively, yet, if the experience of other states means anything, it is a reasonable assumption that South Carolina could employ to advantage many more doctors than are at present available.

In 1824, South Carolina opened a medical school. This act ranked South

*Presented before the members of the House of Representatives and the Senate of the State of South Carolina, January 25, 1939.

Carolina with the forward-thinking, progressive states of the Union. More than a century later, while Governor Blease was in office, the legislative bodies of the State made another progressive action so far as medical education was concerned. On February 8, 1913, a bill was passed by the House of Representatives, and four days later by the Senate, which committed the State henceforward to support medical education as an important branch of the state educational system. By the passage of this bill, the Medical College—the tenth oldest existing medical school in the country—became, in fact, what it had been before in name only. Henceforward, the Medical College of the State of South Carolina was to be an integral part of a great State University system. This was a significant piece of legislation because it directed the government of the State to become directly concerned with the problems of medical education.

Twenty-six years have elapsed since this bill was passed. Medical education has become much more complex and expensive than it was. As one looks backward, medicine used to be a surprisingly easy-going affair, and the teaching of it was comparatively simple. Every spring and fall there was typhoid fever. There was always plenty of malaria. Every winter brought out pneumonia and the doctor wrapped the patient in blankets and gave him fresh air, for no other treatment was perfected. There was no insulin and diabetes was a rapidly fatal disease for any person with sufficient courage to enter a hospital and eat the outlandish diet then in vogue. Pernicious anemia and cancer were regarded as being hopelessly incurable. They were of some medical interest, perhaps, as peculiar disorders, but hopeless from the viewpoint of treatment. Prenatal care for expectant mothers was unheard of. The X-ray machine was undeveloped and of no great practical value. Modern laboratory aids to diagnosis and treatment were undiscovered. Even surgery, for the most part, was carried out on the kitchen table because blood transfusions and other surgical procedures which save many lives today and which must be performed with modern hospital equipment were not available.

Medical knowledge has moved rapidly in the past twenty-six years. What the modern doctor must be able to do now as a matter of routine to help people get well and to prevent disability from illness he could not have known how to do then for the necessary knowledge was lacking. Today, the knowledge is available but the problem is to pass it on in all its comprehensiveness to the student. Thus it is that better and more exhaustive methods of education in medicine have become essential. The young doctor, to be a safe practitioner when he starts out in practice, must now be equipped with all the modern knowledge that can be given him.

In the old days, a young man who wished to become a doctor entered a medical school. As best he could he acquired a smattering of medical knowledge. He spent his days listening to lectures and rarely had the chance to examine a patient. In due course of time he left the medical school with an M.D. degree attached to his name. But his knowledge was almost entirely theoretical. Later, through trial and error, he learned the things he should have known before he hung out his shingle.

Nowadays, theoretical knowledge in medical education is considered of little use. Gone are the days of nothing but lectures for the medical student. In their place has grown up a practical way of learning medicine, and the laboratory and clinic are the places where students acquire this practical knowledge.

The medical school of today, to be properly useful must have four assets: a good physical plant, an adequate budget, a strong faculty and a good student body. The physical plant and budget are significant only as a means for attracting to a medical school a strong faculty, and thus, indirectly, good students.

The modern teacher of medicine requires much more than he did formerly. He must have facilities at his command with which not only to teach his subject but also with which to keep in the front of its development, lest without these facilities his knowledge and teaching become rusty. He must have laboratories in which his pupils can work, and assistants who can help in their supervision. Take a laboratory science like anatomy, for instance. It can no longer be taught as a dead subject. There is little purpose in compelling a student to learn by rote the names and structures of bones, nerves, blood vessels and tissues, and nothing more. Anatomy, now, is alive. From the very beginning medical students must learn that it includes a good deal in the way of names and much more in the way of knowledge about the functioning of the body as a machine. The modern professor of anatomy must have enthusiasm and imagination in his make-up. He needs funds at his disposal with which to buy books and microscopes and other apparatus. He needs a budget so that he can pay his assistants something for their efforts and can himself receive a decent salary. An anatomist with enthusiasm and imagination is not content to work in a medical school which does not furnish him with proper salary, supplies and equipment; no assistant is useful who is not working wholeheartedly. And no medical school without a strong department of anatomy can be efficient because knowledge of anatomy must remain the basis of all medical knowledge.

Anatomy has been chosen to emphasize the necessity of an adequate physical plant and budget to a medical school. What has been said of anatomy applies equally well to the other basic medical sciences, such as bacteriology, biochemistry, pathology and physiology. These subjects are the foundations on which all sound medical education is built; they must be entrenched firmly.

The method of teaching clinical subjects, such as medicine, obstetrics and surgery, also has changed in an equally striking manner. The hospital has become the center of all clinical work. Now the student is placed in direct contact with patients at the middle of his second year or in the beginning of his third year. From then through the rest of his medical school days he is constantly exposed to disease. Disease becomes part of his very existence. He learns how to recognize it, how to treat it, how to apply to patients what he has learned in anatomy, physiology, and pathology; what social service is, and what efficient public health work and good sanitation mean. He even learns as much as possible about preventive medicine, though in so doing he aims to destroy his own future means of livelihood.

Experience is the average man's most impressive teacher. Certainly it is the doctor's. Thus the subjects of which I speak are no longer lecture courses. Instead, the student learns their significance and method of application by actual experience. He lives in the outpatient department or wards of a teaching hospital and in so doing becomes part of a professional team whose job it is to combat illness. Such lectures as he attends are but a supplement to this broad, practical clinical experience. All of this must be supervised carefully so that the student will develop good medical and surgical habits, and so that the patients for whose well-being the hospital is responsible will receive perfect care.

The modern clinical teacher devotes most of his time to two interests—to the patients who come into the hospital and to his students. He, too, must have funds at his disposal for books, equipment and apparatus, for salaries to be paid to assistants, and he, too, must receive adequate payment for his services. A useful clinical teacher finds little free time in which to earn money in private or consultation practice. Most of his energy will be used up in seeing to it that his hospital patients receive the best possible care that can be given them; that his students are drilled properly in the art of diagnosis, treatment and prevention of disease, and that he himself keeps at the front of advancing knowledge.

Definitely, a strong faculty is the most valuable characteristic a medical school can have. There is no doubt that a group of capable teachers working together as a group can offer an admirable medical education under most unfavorable surroundings. At present, however, it is becoming increasingly difficult to attract first-class teachers to medical schools with obsolete plants and inadequate budgets. The type of teacher that is most desirable prefers private practice or to work as an assistant in good surroundings rather than to devote his efforts to any medical school department with poor facilities. On the whole, in any medical school an inferior physical plant connotes poor teaching, poor teaching attracts inferior students, inferior students make poor doctors, poor doctors are a liability and fail to safeguard public health. The future of the health of the people of this country, on last analysis, depends on the product put out by the various medical schools.

Medically speaking, South Carolina faces an interesting problem. Statistics for the past fifteen years show that about 2 per cent of the doctors in the United States die in a year. In South Carolina, at least thirty new doctors are required each year to maintain the present ratio of doctors to population. As has been stated, the ratio of doctors to population in this state is by no means as high as in other parts of the country, so that more than thirty new doctors a year could easily be occupied.

The doctors in South Carolina are unevenly distributed. The majority tend to concentrate in the large cities and towns, comparatively few being found in the rural communities. Figures already assembled have pointed out that new physicians, well trained and capable, brought up and trained outside the State, on the whole, are unlikely to settle advantageously in its rural districts; therefore, to obtain the type of doctor so badly needed, some method must be devised

to attract better than average students to the medical school from the sparsely settled places and, having educated them, to return them to practice in their home communities.

A well-educated general practitioner is expected to treat successfully the majority of illnesses that he encounters. He must be capable, under all circumstances, of determining accurately what is wrong with his patient and of advising the family whether the patient needs a more expert opinion than he himself has to offer. He must practice preventive medicine. He may need to become the public health officer of the community and be responsible for preventing epidemic disease. In order to accomplish such a varied task, he must have the best possible type of education. Surely, the modern family doctor needs a sound scientific background and broad clinical training as much, if not more, than does the specialist.

There is no dearth of good applicants for admission to your Medical School. Many more students apply for admission each year than can be accepted. Every effort always has been made by the School since it was opened to select from its list of applicants only those who are most likely to develop into competent and trustworthy physicians. That this has been done successfully in the past is shown by the fact that a great proportion of the physicians now serving the country districts and small towns of South Carolina are graduates of your School; and that your School at present is highly thought of by the citizens of the State is shown by the fact that of all South Carolina students receiving a medical education in the United States today, two-thirds are being taught in the Medical College of the State of South Carolina. In order to maintain such a record of efficiency, the manner in which the School is conducted in future must carry forward the high ideals and progressive viewpoint which have characterized the institution for the last one hundred and fifteen years.

In the light of the present trend of medical education and medical service in this country one conclusion is inescapable: of all forms of education, medical education is the most costly. Good medical school plants, good faculties, good hospitals in which teaching is being carried on, and good students are needed to make good doctors. If as good physicians are to be provided in the United States in the future as have been provided in the past, every medical college must in some manner be endowed or be generously supported by the public treasury. Adequate medical education for the purpose of training good doctors and thus to safeguard public health is now, by necessity, an expensive business because of the rapid pace with which medical knowledge advances. In any modern medical college student fees alone, no matter how large they may be, cannot meet the cost of education.

PRELIMINARY PROGRAM
FOR
FIFTIETH ANNUAL MEETING
OF THE
ASSOCIATION OF AMERICAN MEDICAL COLLEGES
OCTOBER 23, 24 AND 25, 1939
AT CINCINNATI, OHIO

FIRST DAY

Internships and Residencies.

R. C. BUERKI, Director of Study, Commission on Graduate Medical Education.

Discussion opened by:

WILLIAM PEPPER, Dean,
University of Pennsylvania School of Medicine.

RAYMOND B. ALLEN, Dean,
Wayne University College of Medicine.

J. A. CURRAN, Dean,
Long Island College of Medicine.

B. C. MacLEAN, Director,
Strong Memorial Hospital.

C. W. MUNGER, Director,
St. Luke's Hospital, New York City.

F. G. CARTER, Superintendent,
St. Luke's Hospital, Cleveland.

General Discussion.

SECOND DAY

The Tutorial System in the Harvard Medical School.

WALTER BAUER, Associate Professor and Tutor in Medicine.

Graduate Medical Education.

H. C. WELKER, Professor of Biochemistry and Secretary of the Committee on
Graduate Work, University of Illinois College of Medicine.

Graduate Training in Internal Medicine in a Municipal Hospital.

MARION BLANKENHORN, Professor of Medicine,
University of Cincinnati College of Medicine.

Graduate Training in Pediatrics at the University of Cincinnati.

A. GRAEME MITCHELL, Professor of Pediatrics.

The Training of Surgeons: Method in Use at the Cincinnati General Hospital.

DR. MONT R. REID, Professor of Surgery,
University of Cincinnati.

General Discussion.

THIRD DAY

Further Attempts to Refine the Methods of Selecting Medical Students.

O. W. HYMAN, Dean,
University of Tennessee, College of Medicine.

Student Health Service.

H. S. DIEHL, Dean,
Division of Medical Sciences, University of Minnesota.
JOHN SUNDWALL, Professor of Hygiene and Public Health,
University of Michigan.
NATHAN T. MILLIKIN, Instructor in Physical Diagnosis and Medicine,
Dartmouth Medical School.
E. S. RYERSON, Assistant Dean,
University of Toronto Faculty of Medicine.

Discussion opened by:

M. E. BARNES, Professor of Hygiene and Preventive Medicine,
State University of Iowa.
PAUL H. STEVENSON, Assistant to the Dean,
University of Cincinnati College of Medicine.

General Discussion.

MONDAY EVENING: Dinner

President's Address.

WILLARD C. RAPPLEYE, Dean,
Columbia University College of Physicians and Surgeons.

TUESDAY EVENING:

Executive Session.

The Foxglove

It's an ancient yet tellable story
 That an old woman living in Shropshire
 Had a far better treatment for dropsy
 Than the medical men of the Empire.

So great her success they had to confess
 That her treatment was really amazing
 The man who could best it find and express
 Was the botanist, William Withering.

Her ethics perhaps were good in her day,
 What was in the cure she never did say,
 But Withering heard, in 'round-about way,
 She used most of the herbs found in Shropshire.

He studied in detail all the above
 And found in the cure a lot of humbug,
 But hid in it was the purple foxglove
 Which he proved to be the sole active drug.

In seventeen hundred seventy five
 He began to treat dropsy with foxglove,
 To make it quite sure that all would survive,
 One man could take more than he gave to five.

At first a decoction he made, then tried,
 Preferring the powder, cast it aside,
 "Withering's Infusion" so long prescribed
 Still vies with the tincture, at the bedside.

When he discovered the way it did act,
 He gave this plain rule, to others direct:
 "Just give it until there is an effect
 On the kidney, the pulse, or G.I. tract."

Thus the sheet anchor of cardiac drugs
 Was weighed, and the ship has weathered the breeze
 Of public opinion, with its icebergs,
 Until every doctor with him agrees.

When did he live? Who were his compeers?
 Grows more important with passage of years.
 While he lived quietly in Birmingham,
 Paul Revere, riding, was spreading alarm.

Benjamin Franklin was using a kite
 To determine the nature of lightning,
 But in a few years, perhaps in the night,
 Was sick and a patient of Withering.

Soon his neighbor and friend, Edward Jenner,
 Would announce how he came to discover
 That small pox may be banished forever
 As it was from the milkmaids of Gloucester.

It is something akin to creation
 To divine such a casual relation,
 For the foxglove and inoculation
 Came from more than just keen observation.

On his tomb at Edgbaston the foxglove
 Wreaths drooping its head in his memory,
 While millions accept as gifts from above
 The benefits of his discovery.

So in June when the foxglove is blooming
 With a beauty both useful and pleasing,
 It is telling mankind of the blessing
 That comes to the heart-sick, through Withering.

—H. A.

**JOURNAL
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Number 5

Fiftieth Anniversary Meeting

The fiftieth anniversary meeting of the Association of American Medical Colleges will be held in Cincinnati, Ohio, October 23-25, 1939. The Host is the University of Cincinnati College of Medicine. Headquarters hotel is the Netherland Plaza. A cordial invitation to attend this meeting is extended to everyone who is interested in medical education in any of its phases.

Elsewhere in this issue is published the preliminary program for the meeting. The topics to be discussed are of more than passing interest. They are live subjects for discussion at this time. Medical colleges and hospitals will be interested in the symposium on Internships and Residencies. A special committee appointed by the Executive Council of the Association is now working on plans which it is hoped will eventually solve many, if not all, the vexing problems arising out of intern placement by which medical colleges, hospitals and graduates are beset.

Graduate medical education is receiving a great deal of attention today. The symposium on that topic is a timely one therefore. The authors of the papers to be read have given much thought to the subject. The discussion which these papers will create should prove most helpful in throwing a clear light on what is and should be done in this field.

Universities, colleges and medical schools are greatly concerned with the student health problem. In some institutions this problem has been virtually solved. Others are still groping for an adequate solution. The men who will participate in this symposium have had much experience with student health.

Their papers will be helpful to those institutions which have not yet established a student health service or whose service is not yet fully developed. There is general agreement that the university has a definite responsibility for the health of its students. Just how far this responsibility should go, has not been definitely settled. The symposium on this topic will be helpful in the development of plans for a student health service which not only will be efficacious but acceptable to all concerned.

So, why not plan to attend this meeting and get at first hand what experts have to say on all these topics. The privilege of discussion is extended to all who wish to make use of it.

* * *

Committee on Internships

As announced in the July issue of the *Journal*, a committee on internships was appointed by the Executive Council of the Association of American Medical Colleges for the purpose of working out a plan which would prove helpful in solving some of the problems connected with the selection and appointment of interns.

The committee decided that the first step should be to set a definite date on which all intern appointments will be announced by all hospitals. The date chosen is November 15th. A letter setting forth the aims of the committee was sent to 361 selected hospitals. These 361 hospitals give placement to 5,042 interns. Only 24 hospitals did not reply to this letter. Of the 337 hospitals replying, 243 unqualifiedly agreed to cooperate in the suggested program; 45 agreed to do with certain pertinent reservations, such as "if we have applications for placement by that time;" and

"we suggest a later date—say, November 30 or December 1." Only 33 hospitals refused to cooperate because either they did not agree with the plan or they are part of a placement plan already in existence. Sixteen hospitals still have the matter under advisement, although, in general, they agree as to the desirability of some plan.

The 243 hospitals which agreed without reservation place 3,150 interns; the 45 hospitals replying qualifiedly place 559 interns; the 33 hospitals which refused to cooperate place 643 interns; the 16 hospitals still thinking about the matter place 343 interns.

A report on this study will be made to the American Hospital Association at its annual meeting to be held in September, and the committee will report to the Association of American Medical Colleges in October. No further work will be done by the committee until after October.

The committee feels that the result of this study is most gratifying and gives promise that eventually a solution will be found for all the problems by which the intern question is beset. The hospitals selected for this study represent a very fair sampling of all hospitals served by interns, although the total number is only slightly in excess of 5 per cent of all approved hospitals. The replies received from the hospitals indicate a keen desire to cooperate in any effort made to bring order out of chaos. A few hospitals expressed the opinion that the Association of American Medical Colleges should act as a central placement bureau — a service which has been given for the past two years with fair success. Of course, the number of internships far exceeds the number of available interns. And the intern problem is a far more acute one for the small hospital than it is for the large hospital. Many hospitals, comparatively speaking, do not have any difficulty securing interns, but there are a large number of small hospitals which offer splendid opportunities for intern service which find it almost impossible to secure interns. Perhaps, a reappor-

tionment of the number of interns taken by some of the large hospitals, a reduction in numbers, will make available for the small hospital the needed interns. This and other problems await solution. The committee is hopeful that it will be able to iron out all the wrinkles now present in the troublesome intern problem. At least, it feels that with the fine beginning made, and the extended cooperation of the hospitals approached, there is every reason to hope that something worth while can be accomplished in this direction.

* *

Teaching of Tuberculosis In Medical Schools

The National Tuberculosis Association, through its Committee for Undergraduate Education in Tuberculosis, of which Dr. H. G. Weiskotten was chairman, makes known the following points stressed by the Committee:

Various aspects of tuberculosis are included in practically all of the pre-clinical as well as the clinical courses. The weak point in the undergraduate program appears to be a rather general lack of sufficient coordination of this knowledge and experience to enable the student to take a broad point of view of the disease, both preventive and curative, and to appreciate all of its implications to the individual, the family and the community.

Such a coordinating program in the fourth year not alone would involve no additional or specialized course but would provide an experience that is important in connection with many phases of medical practice. It involves training in the principles of epidemiology, of environmental and social factors in the causation of disease and in the preventive aspects of medicine. It is the opinion of the committee that these various aspects of medicine can be very effectively impressed upon the student in connection with a broad consideration of the subject of tuberculosis.

The committee gave considerable attention to the formulation of a program which it could recommend and which

would improve the standards of undergraduate medical education in tuberculosis.

The members of the committee were in general agreement as to the following statements:

1. Questionnaires sent out to schools are not particularly reliable or productive.

2. The laying down of minimum specific course requirements is unwise and unpromising.

3. Fourth-year students should acquire training and experience in tuberculosis under a competent and stimulating teacher who is a well-trained clinician, familiar with the bacteriology and pathology of the disease and experienced as well in its public health, preventive and social aspects. This training and experience should be acquired in connection with actual clinical experience in the outpatient department and on the tuberculosis wards.

4. It might be wise for a competently-trained teacher in tuberculosis, familiar with educational methods and the curriculums of medical schools, to visit certain medical schools in an effort to stimulate their interest toward better coordination and greater efficiency in the undergraduate program in tuberculosis.

5. If a few outstanding schools would develop a satisfactory program of integrating the students' experience and training as related to tuberculosis, under a competent teacher of tuberculosis, other schools would tend to follow their example.

6. The committee wishes to stress the value of the annual examination of medical students as a teaching medium. There is no better chance to emphasize the preventive aspects of the disease than to point out its significance to the student himself, to his family and to his associates.

Finally, the committee discussed the question as to whether tuberculosis should be taught as a specialty or as a part of the essential basic equipment for a career in medicine. It was agreed that the latter was the justifiable objective of the undergraduate course in contrast with special postgraduate training. Emphasis should not be placed on any specific course standard but rather upon the acquiring of an intelligent understanding of the broad implications of the disease with special stress upon its social aspects. It is believed that home visits by students to tuberculosis households in connection with their clinical training would exemplify this principle.

* * *

New Jersey Licenses Interns

An amendment to the medical practice act was passed by the state legislature recently making it mandatory, after July 1, 1939, for interns to be approved by the State Board of Medical Examiners prior to their acceptance by any hospital. The fee for this license is \$10.

* * *

Harold Rypins

At the moment of going to press word is received of the sudden death from a heart attack of Harold Rypins, secretary of the New York State Board of Medical Examiners. Dr. Rypins has been a constant attendant of the meetings of the Association. He was very active as a member of the Federation of State Medical Boards, of which he was a past-president, and was an able and forceful representative from that body on many important commissions and committees. His many friends will miss Dr. Rypins but with fine memories and good thoughts.

College News

Wake Forest College School of Medicine

This college, located in Wake Forest, will be moved to Winston-Salem and expanded from a two year to a four year medical school. The entire resources of the Bowman Gray fund in the Winston-Salem Foundation will be available for this move and expansion. The fund is adequate for building and endowment purposes. The North Carolina Baptist Hospital will serve as the school's official hospital. Other hospitals in Winston-Salem will be available for clinical teaching. A medical school administration and laboratory building will be erected on the Baptist Hospital property. The school will be moved as soon as this building is completed. The present medical building at Wake Forest will be used by the College of Liberal Arts.

During the first year at Winston-Salem, the school will be operated as a two year school. The third and fourth years will be added during the next two years.

* * *

University of Pennsylvania School of Medicine

Dr. Howard Canning Taylor, Jr., of New York, has been appointed to the William Goodell Professorship of Gynecology.

Dr. Taylor, who fills the vacancy caused by the death of Dr. Floyd E. Keene, is a graduate of the Hill School, the Sheffield Scientific School of Yale University, the College of Physicians and Surgeons of Columbia University, and the Presbyterian Hospital of New York.

He is at present associate professor of obstetrics and gynecology at the College of Medicine at New York University.

Dr. Taylor comes to the University at a time when gynecology and obstet-

rics are being brought more closely together. The combined department will be housed in a new building which will be known as the Crothers Dulles Memorial Hospital and which will be a unit of the University Hospital.

Construction of the new building is being made possible through a bequest from Mrs. Andrew C. Dulles, mother of the late Crothers Dulles, and a bequest from his sister, who was Baroness Fontana.

Dr. Alfred N. Richards, professor of pharmacology, University of Pennsylvania School of Medicine and Graduate School of Medicine, has been appointed vice president of the university in charge of medical affairs to succeed the late Dr. Alfred Stengel. Dr. Richards will retain his faculty connections and will also devote part of his time to his research on physiology of the kidney.

The School of Medicine has established a department of public health and preventive medicine, with Lieut. Col. Arthur Parker Hitchens, Medical Corps, U. S. Army, as head of the department and George S. Pepper professor of public health and preventive medicine. From 1920 to 1929 the university conducted a school of hygiene and public health. That course will be revived, it is reported, and all undergraduate courses in this field will also be placed under the new department.

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University of Illinois

The appointment of Dr. Raymond B. Allen, since 1936 Dean of the Wayne University College of Medicine, to the post of "Executive Dean of the Chicago Colleges of the University of Illinois," and the appointment of Dr. Percival Bailey of the University of Chicago as professor of Neurology and Neurological Surgery in the College of Medicine in the University of Illinois, is announced.

The new executive Dean's position will co-ordinate the educational and research activities of the university's medical, dental, and pharmacy units, all located in Chicago. The three colleges will continue as separate entities. Dr. Allen in his new capacity will be a direct representative of President Arthur Cutts Willard whose office is on the main campus at Urbana.

Also announced is the appointment of Dr. Hans Brunner as assistant Professor of Otolaryngology in the College of Medicine, one-half time beginning September 1, 1939.

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University of Virginia

Mr. Charles A. Stone has contributed \$2,000 for the support of studies on the treatment of spontaneous hemorrhage in the newly born with Vitamin K by Dr. W. W. Waddell and for Dr. Chanutin's investigations of pressor substances.

Dr. Sydney Britton was awarded a research grant of \$2,500 from the Committee on Research in Endocrinology of the National Research Council for aid in his investigations of cortico-adrenal extract.

Dr. Alfred Chanutin has been given a research grant of \$2,500 from the John and Mary R. Markle Foundation for studies on pressor substances with the aid of the ultra-centrifuge.

Harvey E. Jordan, Ph.D., professor of histology and embryology and assistant dean of the department of medicine, University of Virginia, Charlottesville, has been appointed dean to succeed the late Dr. James Carroll Flippin.

Dr. Eugene M. Landis, assistant professor of medicine at the University of Pennsylvania School of Medicine, Philadelphia, has been appointed professor of internal medicine at the University of Virginia Medical Department to succeed the late Dr. James C. Flippin.

Dr. Samuel A. Vest, of Johns Hopkins University has been appointed professor and head of the department of urology to succeed the late Dr. J. H. Neff.

New York University College of Medicine

Appointment: Dr. John C. A. Gerster, clinical professor of surgery.

Promotions: Dr. Currier McEwen and Dr. Elaine P. Ralli from assistant professor to associate professor of medicine; Dr. William Goldring and Dr. Norman Jolliffe from assistant professor of clinical medicine to associate professor of medicine; Dr. Herbert Chasis and Dr. Evan W. Thomas from instructor in medicine to assistant professor of medicine; Dr. Morris Block and Dr. Marshall S. Brown, Jr., from instructor in clinical medicine to assistant professor of clinical medicine; Dr. W. Howard Barber and Dr. George A. Koenig from clinical professor of surgery to associate professor of surgery; Dr. Louis C. Lange, from assistant clinical professor of surgery to clinical professor of surgery; Dr. Frank C. Combes, from assistant professor of dermatology and syphilology to associate professor of dermatology and syphilology; Dr. Evan W. Thomas, from assistant clinical professor of dermatology and syphilology to assistant professor of dermatology and syphilology; Dr. Arno E. Town, from instructor in ophthalmology to assistant clinical professor of ophthalmology; Dr. Amedeo S. Mazzoni, from instructor in pharmacology to assistant professor of pharmacology; Dr. Abram Blau, from instructor in psychiatry to assistant clinical professor of psychiatry.

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University of Oklahoma School of Medicine

Appointments: Dr. Henry W. Harris, assistant in obstetrics; Dr. Maynard S. Hart, assistant director of the laboratories of the University and Crippled Children's Hospitals. Dr. James Richard Huggins, assistant in medicine. Dr. James P. Luton, assistant in ophthalmology. Dr. Owen Royce, assistant director of the Outpatient Department of the University and Crippled Children's Hospitals. Dr. William Edgar Strecker, assistant in gynecology. Dr. Harold A. Shoemaker, professor of

pharmacology, appointed assistant dean vice Dr. Louis A. Turley relieved. Dr. Irwin Clinton Winter, assistant professor of pharmacology. Dr. Benedict E. Abreu, instructor in pharmacology. Mr. Lowell Thomas Crews, research fellow in biochemistry; Mr. Evan Leonard Copeland, research fellow in physiology.

Promotions: Dr. Henry Hubert Turner, assistant professor of medicine advanced to rank of associate professor of medicine; Dr. Ernest Lachmann, assistant professor of anatomy advanced to rank of associate professor of anatomy; Dr. Leo F. Cailey, Dr. E. Gordon Ferguson, Dr. James Jackson Cavniss, Dr. James Robert Reed, Dr. Fay Maxey Cooper, associates in ophthalmology advanced to rank of assistant professors of ophthalmology.

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Medical College of Virginia

Appointments: Dr. Richard W. Fowlkes, associate professor of dermatology and syphilology; Dr. Patrick H. Drewry, assistant professor of neuro-psychiatry.

Promotions: Dr. Arthur S. Brinkley, Dr. F. S. Johns and Dr. Carrington Williams, from associate professor to professor of clinical surgery; Dr. O. B. Darden and Dr. Howard R. Masters, from associate to associate professor of neuropsychiatry; Dr. John S. Horsley, Jr., from assistant professor to associate professor of surgery; Dr. Henry S. Stern, from assistant professor to associate professor of pediatrics; Dr. Harry Walker, from assistant professor to associate professor of medicine; Dr. Harry J. Warthen, from assistant professor to associate professor of surgery and history of medicine; Dr. George Z. Williams, from assistant professor to associate professor of pathology; Dr. S. A. Anderson, Jr., from associate to assistant professor of pediatrics; Dr. Harvie DeJ. Coghill, from associate to assistant professor of pediatrics and neuropsychiatry; Dr. Louise F. Galvin, from instructor to assistant professor of

pediatrics; Dr. C. L. Outland, from associate to assistant professor of preventive medicine.

A portrait of Dr. David Hunter Tucker, former dean and professor of the theory and practice of medicine, has been presented to the college by Dr. Beverley R. Tucker, a great nephew, and emeritus professor of neuropsychiatry at the college, and Dr. Stuart McGuire, chairman of the Board of Visitors.

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University of California Medical School

Promotions: I. L. Chaikoff, assistant professor to associate professor of physiology; Paul L. Kirk, assistant professor to associate professor of biochemistry; Amos U. Christie, and William C. Deamer, assistant professor to associate professor of pediatrics; Dudley W. Bennett, assistant professor to associate clinical professor of medicine; Myrl Morris, assistant clinical professor to associate clinical professor of pediatrics; M. Laurence Montgomery, assistant professor to associate clinical professor of surgery; John D. Reese, instructor to assistant professor of anatomy; Herbert G. Johnstone, instructor to assistant professor of bacteriology; Saxton T. Pope, Jr., instructor to assistant professor of medicine; Charles T. Hayden, instructor to assistant professor of obstetrics and gynecology; Robert B. Aird, instructor to assistant professor of surgery.

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Wayne University College of Medicine

Appointments: Frederick F. Yonkman, Ph.D., M.D., professor of pharmacology and therapeutics and head of the department; Arnold J. Lehman, Ph.D., M.D., research associate in pharmacology and therapeutics (with the rank of assistant professor); Harold F. Chase, M.D., instructor in pharmacology.

Promotion: Dr. Edgar H. Norris, professor of Pathology (in charge of teaching) to be head of the department.

*University of Manitoba
Faculty of Medicine*

Appointments: Dr. J. D. Adamson, professor of medicine and head of the department of medicine in the Winnipeg General Hospital; Dr. O. S. Waugh, professor of surgery and head of the department of surgery in the Winnipeg General Hospital; Dr. J. D. McQueen, professor of gynaecology and director of obstetrics and gynaecology and gynaecologist to the Winnipeg General Hospital; Dr. Ross Mitchell, professor of obstetrics; Dr. M. R. MacCharles and Dr. C. E. Corrigan, assistant professors of surgery; Dr. F. G. McGuiness, associate professor of obstetrics; Dr. C. R. Rice, assistant professor of gynaecology; Dr. L. G. Bell, associate professor of medicine.

Each of the following who have recently retired from active teaching will be given rank of professor emeritus: Dr. A. J. Douglas, Dr. J. A. Gunn, Dr. D. S. Mackay, and Dr. C. R. Gilmour.

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Meharry Medical College

Appointments: Dr. Harold D. West from associate to full professor of biochemistry; Dr. William A. Mason to assistant professor of clinical medicine (syphilology); Dr. Crawford C. Harwell, to assistant professor of clinical surgery; Dr. Matthew Walker, to assistant professor of surgery; Dr. Nathaniel S. Shofner, to associate professor of clinical surgery; Dr. Elkins L. Rippy, to assistant professor of clinical surgery; Dr. M. I. Davis, to assistant professor of clinical dermatology; Dr. Raymond D. Crowe, assistant professor of clinical medicine; Dr. P. G. Morrissey, associate professor of clinical urology.

Special lecturers: Dr. W. A. Bryan, lecturer in clinical surgery; Dr. W. C. Dixon, lecturer in clinical surgery; Dr. Duncan Eve, lecturer in clinical surgery; Dr. H. M. Tigert, lecturer in clinical gynecology; Dr. B. W. Wright, lecturer in clinical urology.

Hahnemann Medical College

Hahnemann Medical College has established the position of Research Professor of Physiology, in connection with that Department, and the research laboratories will be in charge of Dr. J. F. McClelland, of the University of Minnesota, whose work on "Iodine and the Incidence of Goitre" is well known in the research field. Doctor McClelland's title will be Research Professor of Physiology. His work will combine physiological chemistry and physiology.

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*University of Mississippi
School of Medicine*

Dr. David S. Pankratz has been appointed professor of anatomy to succeed Dr. A. R. Buchanan who has joined the faculty of the University of Colorado School of Medicine.

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*Temple University
School of Medicine*

Promotions: Dr. Reuben Friedman to assistant professor of dermatology and syphilology; Dr. Michael Scott to assistant professor of neurosurgery; Dr. Glenn G. Gibson to assistant professor of ophthalmology.

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*Duke University
School of Medicine*

Dr. Molly Harrover Erickson, of the Montreal Neurological Institute, recently addressed the students and staff on "Psychological Studies Upon Individuals with Organic Disease of the Central Nervous System."

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*University of Alabama
School of Medicine*

Dr. Duff S. Allen, Assistant Professor of Clinical Surgery, Washington University, St. Louis delivered two lectures on May 12 and 13: (1) "Goiter and its Effect on the Heart," and (2) "The Discovery of the Heart Sounds." The lectures were part of the program of the Southern Provincial Assembly of Phi Beta Pi, Professional Medical Fraternity.

*Louisiana State University
School of Medicine*

Dr. Howard H. Beard, Professor and Director of the Department of Biochemistry spent the summer in the laboratory of the Department of Biochemistry at the University of California, in Berkeley, where he studied various phases of creatine and creatinine metabolism.

Appointments: Dr. Merrill W. Everhart, instructor in pediatrics; Dr. Walter S. Wilde, instructor in physiology; Dr. Audrey Heintz, assistant in pediatrics; Dr. Harry A. Davis, instructor in surgery; Dr. M. J. Carl Allinson, instructor in biochemistry; Dr. Ralph W. Wager, instructor in pharmacology and experimental therapeutics.

The Department of Medicine of the School of Medicine of Louisiana State University has just instituted a visiting medical service for teaching purposes, in cooperation with the Department of Public Welfare of Orleans Parish. Medical services are supplied to clients on relief in the Department of Public Welfare by students in the School of Medicine, who are accompanied on every visit by an instructor and who work under his supervision.

Dr. Edgar Hull is directing this service, assisted by Dr. Chester S. Fresh and Dr. Richard T. Stephenson, who have the title of field instructors. Calls for medical service are received by the Administrator of the Visiting Physician Service of the Department of Public Welfare, and are relayed by him to one of the field instructors, who sees the patient in company with the medical student assigned to the case. The director, in the capacity of consultant, visits acutely ill patients whose recovery seems unduly delayed as well as all patients who request a change of physician. He also visits chronically ill patients at intervals, and reviews each month the bedside notes and prescriptions issued to the patients seen during the month.

The School of Medicine supplies consultants as needed and furnishes the necessary laboratory services.

Visiting services of this sort form an important part of the instruction in many English and Scotch medical schools, and the institution of such instruction in the Louisiana State University School of Medicine is regarded as an important step forward.

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*Louisiana State University
Graduate School of Medicine*

Dr. Frederick Fitzherbert Boyce, who has recently joined the Faculty of the Graduate School of Medicine of Louisiana State University, won the 1939 award of the Mississippi Valley Medical Society for his paper entitled "Toxic thyroid disease as a surgeon would have the general practitioner conceive it, with a special note on the liver factor." The prize is a cash award and a gold medal. Dr. Boyce will read his prize essay at the annual meeting of the Society in Burlington, Iowa, in September, at which time he will be presented formally with the award. He has also been invited to appear on the program as a guest speaker.

Dr. Boyce is a graduate of Harvard University and of the Yale University School of Medicine. He is a Fellow of the American College of Surgeons, and is certified by the American Board of Surgery.

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University of Chicago

The first endowed fellowship in pediatrics at the University of Chicago has been established by a gift of \$25,000 from the Benjamin J. Rosenthal Charities. The endowment will provide an annual fellowship of about \$1,000, it is reported.

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*University of Georgia
School of Medicine*

Dr. George Lombard Kelly, dean, has resigned as superintendent of the University Hospital. Dr. Kelly will serve in an advisory capacity until September 1, when he will become medical director of the teaching facilities at the hospital, it was stated.

Albany Medical College

The one hundredth anniversary of Albany Medical College was celebrated at its annual commencement June 12 with Drs. James Ewing, New York, and La Salle Archambault, Albany, as guest speakers. Dr. John E. Heslin, president of the college alumni, presented a commemorative plaque on behalf of the alumni association to a member of the graduating class. At a banquet in the evening Dr. Heslin was toastmaster and the speaker was Mr. Raymond Clapper, Washington, D. C.

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*Western Reserve University
School of Medicine*

Dr. John J. Thomas, associate clinical professor of obstetrics, retired at the end of the school year June 14. Dr. Thomas graduated from Western Reserve in 1893 and has been a member of the faculty for forty-three years.

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Johns Hopkins University

Dr. Thomas B. Turner of the International Health Division of the Rockefeller Foundation has been appointed professor of bacteriology at the Johns Hopkins University School of Hygiene and Public Health.

Dr. William H. Barker, instructor in medicine, has been appointed assistant dean in charge of student relations.

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*Medical College of the
State of South Carolina.*

Dr. Archibald J. Buist has resigned as professor of obstetrics and gynecology and has been made professor emeritus.

Promotions: Dr. Bernard S. Kalayjian, to be assistant professor of radiology and electrotherapy; Chester A. Swinyard, Ph.D., assistant professor of anatomy; Dr. Mylnor W. Beach, professor of pediatrics; Dr. William H. Kelley, professor of medicine; Dr. Frederick E. Kredel, professor of surgery; Dr. Robert B. Taft, professor of radiology and electrotherapy; Dr. Frank A. Hoshall, professor of orthopedics.

*Indiana University
School of Medicine*

Dr. Alois B. Graham, professor of surgery (proctology), Indiana University School of Medicine, Indianapolis, was honored at a meeting in the James Whitcomb Riley Memorial Hospital May 8, marking his retirement from the medical school faculty after forty years' service.

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*University of North Carolina
School of Medicine*

Dr. Isaac Hall Manning, professor of physiology, University of North Carolina School of Medicine, Chapel Hill, since 1901 and dean of the school from 1905 to 1933, has retired from active duty and will be professor emeritus.

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*University of Minnesota
Medical School*

A gift of \$14,400 has been given anonymously to the Medical School to establish the Ivar Sivertsen Fund for cancer research. The fund will be administered by Drs. Harold S. Diehl, Ivar Sivertsen, Elexious T. Bell, Maurice B. Visscher, Owen H. Wangensteen and Karl W. Stenstrom, Ph.D., and will finance primarily a study of dietary and hormonal influences on malignant conditions.

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*University of Arkansas
School of Medicine*

On July 1, 1939, Stuart P. Cromer, Ph.D. and M.D. (1935) of Northwestern University, became dean of the School of Medicine of the University of Arkansas, succeeding Dean Frank Vinsonhaler who was named Dean Emeritus. After several years of experience in teaching in medical schools, Dr. Cromer became a member of the staff of the Council of the American Medical Association, from which position he came to the University of Arkansas.

Jefferson Medical College

Dr. James R. Martin, chief surgeon in the State Hospital for Crippled Children at Elizabethtown, has been named the James Edwards professor of orthopedic surgery on the senior faculty of Jefferson Medical College. He will succeed Dr. J. Torrance Rugh, who has resigned after occupying the chair since 1918. Dr. Rugh has been elected a professor emeritus of the College.

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*State University of Iowa
College of Medicine*

Promotions: Dr. Olan R. Hyndman, to associate professor of surgery; Dr. Wilbur R. Miller, to associate professor of psychiatry; Dr. John W. Dulin, to assistant professor of surgery; Titus C. Evans, Ph.D., to research assistant professor of radiology; Dr. Jacques S. Gottlieb, to assistant professor of psychiatry; Dr. Adolph L. Sahs, to assistant professor of neurology.

Dr. Ralph H. Heeren, assistant professor of hygiene and preventive medicine, and Harry M. Hines, Ph.D., professor of physiology, have been granted leaves of absence for the coming academic year.

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*Washington University
School of Medicine*

Dr. Robert A. Moore, associate professor of pathology, Cornell University Medical College, has been appointed Edward Mallinckrodt professor of pathology.

*Boston University
School of Medicine*

Dr. Reginald Fitz has resigned as director of the Evans Memorial and professor of medicine. He will be succeeded by Dr. Chester S. Keefer. Dr. Charles F. Branch, professor of pathology has been appointed associate director.

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Dalhousie University

The new building adjoining the clinic building, which will house the medical and dental laboratory was formally opened August 30th. A cut of this building was published in a previous issue of the *Journal*.

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*Cornell University
Medical College*

Dr. Richard W. Jackson has been promoted to associate professor of biochemistry.

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University of Alberta

The construction of seven maternity wards as an addition to present facilities of the University Hospital has been authorized by the provincial legislature. Construction will be begun at once. Present facilities will be completely modernized. This addition will add much to the teaching facilities of the Faculty of Medicine in obstetrics. There will also be available seventy-six additional obstetrics beds in the Misericordia Hospital in which the Faculty does considerable teaching. The General Hospital, another teaching unit, is adding 100 beds at a cost of \$250,000.

Book News

Infections of the Hand

By Allen B. Kanavel, M.D., Late Professor of Surgery, Northwestern University Medical School. 7th Ed. Lea & Febiger, Philadelphia. 1939. Price, \$6.

This revision was the last task which Dr. Kanavel finished just before his sudden and tragic death. In it he incorporate the results of his unceasing experimental and anatomical investigations and clinical observations up to the moment of its completion. The work is based on the anatomical facts involved in the treatment of these infections. The rules of diagnosis which are laid down and the surgical incisions suggested are the logical outcome of the anatomical studies. Particular emphasis is placed on tenosynovitis. Throughout, the objective is not only to control infection but to preserve function as well. In the present edition greater emphasis than formerly has been placed upon this phase of the subject and various new procedures, fully illustrated, have been introduced.

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Principles of Hematology

By Russell A. Haden, M.D. Chief of the Medical Division of the Cleveland Clinic (Ohio). Lea & Febiger, Philadelphia. 1939. Price, \$4.50.

This work reflects the rapid advances of hematology in recent years and includes the more essential new methods for investigating the blood and the new clinical conceptions of the blood disorders. The purpose of this book is to simplify the study of these disorders for both the student and physician. To this end, unusual and difficult technical methods have been purposely omitted and infrequent variations of the blood cells and rare blood dyscrasias have not been discussed.

The different cells of the blood have been described in detail and the mechanism by which each varies from the normal has been discussed. Special emphasis has been placed on the technic of examination as clinical interpretations necessarily depend on accurate and complete laboratory data. The different groups into which the blood dyscrasias naturally fall are discussed from the standpoint of differential diagnosis and illustrative cases are presented. The illustrations include 168 original photomicrographs and 95 original charts and drawings. The illustrative case histories are an outstanding feature of the work.

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Schafer's Essentials of Histology

Edited by H. M. Charlton, University Lecturer on Histology, Oxford. 14th Ed. Lea & Febiger, Philadelphia. 1938. Price, \$5.

Fifty-three years ago this book first appeared under the authorship of the late Sir Edward Sharpey-Schafer. During this entire period the work has maintained its position of superiority and popularity among text books of this subject. In this new edition the general character of the work has been retained. The 50 lessons have, however, been subjected to a thorough revision. Many of the older illustrations have been eliminated and many new photographs take their place. Each of these photographs has been reproduced in a size sufficient to obtain a maximum of detail. The colored illustrations are numerous and of unusual excellence. The text itself retains the completeness and the clarity that has enabled generations of students to grasp the subject quickly and easily.

The organization of the material remains the same. It is divided into 50 lessons each of which may be expected to occupy one to three hours.

*Textbook of
General Surgery*

By Warren H. Cole, M.D., Professor of Surgery, University of Illinois College of Medicine, and Robert Elman, M.D., Associate Professor of Surgery, Washington University School of Medicine. 2nd Ed. D. Appleton-Century Company, New York. 1939. Price, \$8.

The work of two experienced teachers and surgeons resulting from their courses in surgery at Washington University. General surgery is stressed; surgical specialties are omitted. The subject is presented from the physiologic point of view; operative procedures are not described in detail. The authors have aimed to keep the book within the realms of a teaching text and have succeeded extraordinarily well in doing so. This is a good text for the medical student.

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Textbook of Medicine

By Various Authors. Edited by J. J. Conybeare, M.D., Physician to Guy's Hospital. 4th Ed. William Wood & Company, Baltimore. 1939. Price, \$6.75.

A thorough revision with addition of a section on psychological medicine, including the psychoneurosis and the psychoses; new articles on the heart in myxedema, on deficiency conditions, on peripheral circulatory failure, acute disseminated encephalitis, hypertensive encephalopathy and neuromyelitis optica, protamin zinc insulin in diabetes, lymphogranuloma inguinale and regional ileitis.

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*Laboratory Manual of the
Massachusetts General Hospital*

By Francis T. Hunter, M.D. Associate Physician and Clinical Pathologist. 3rd Ed. Lea & Febiger, Philadelphia. 1939. Price, \$1.75.

This work, intended originally as a pocket outline of the routine laboratory work and bedside procedures done by

a single group of interns, has made a much wider place for itself among students and practitioners. The procedures described are actually in use today in the Massachusetts General Hospital and are sanctioned by its staff. The work is a veritable mine of practical information from cover to cover. Because of its small size, the book can be carried in the pocket, ready for use at any time. Students will like this book.

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*Manual of Public
Health: Hygiene*

By J. R. Currie, M.D., Henry Mechan Professor of Public Health, University of Glasgow. William Wood & Company, Baltimore. 1938. Price \$5.

Although small in size, the book covers many fields with special stress on social hygiene. Discussions are presented of inheritance; maternity and child welfare; school, mental, personal and industrial hygiene; social insurance; public health administration; vital statistics; food; ventilation; lighting; water supply; waste disposal; housing; hospitals; prevention of disease; infection; community diseases; infestation. As these subjects are being stressed today as important for inclusion of the medical school curriculum, students will find good use for this book.

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*Introductory Guide to
Biochemistry.*

By Sidney Bliss, Ph.D., Professor of Biochemistry, Tulane University of Louisiana School of Medicine. W. B. Saunders Company, Philadelphia, 1939. Price, \$1.25.

This is not a textbook. It is the story of biochemistry, told in terms which the student can understand, with the intention of arousing his interest in the subject. Chemical symbols and formulae of all kinds are conspicuous by their absence. The usefulness of the book should be in interesting him in biochemistry without creating the impression that he must be a chemist in order to understand the subject.

Human Pathology

By Howard T. Karsner, M.D., Professor of Pathology, Western Reserve University. 5th Ed. Philadelphia. J. B. Lippincott Company. 1938.

Complete revision of former editions, especially of the bibliographic references. The book covers the fields of general pathology, pathologic and morbid anatomy, pathological histology, functional or pathologic physiology and the general subjects of bacteriology and immunology. The subject matter is complete; the text is clear; the illustrations are excellent, many of them original. The numerous references are evidence of a large amount of painstaking work which the student probably will not appreciate because of lack of time. For the inquiring practitioner they may prove to be a boon.

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Martini's Principles and Practice of Physical Diagnosis

Edited by Robert F. Loeb, M.D., Associate Professor of Medicine, Columbia University. From the authorized translation by George J. Farber, M.D. Philadelphia. J. B. Lippincott Company. 1938.

Any book which can be carried in the pocket will appeal to the student. And when it stresses the use of the senses in the recognition and evaluation of disease, instead of a reliance on laboratory tests and methods, the student should be impressed with the possibilities of the book as a means of imparting useful and usable knowledge. Such books cannot be recommended too highly to students.

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Clinical Examination of the Nervous System

By G. H. Monrad-Krohn, M.D., Professor of Medicine in the Royal Frederick University, Oslo, Norway. 7th Ed. New York. Paul B. Hoeber, Inc. Medical Book Department of Harper & Brothers. 1938. Price, \$3.

An outstanding feature of this excellent textbook for students is the cor-

relation of neurology and psychiatry which should be helpful to the student who intends to become a general practitioner. This edition has been completely revised and many new illustrations have been added. The author's experience in the clinic is reflected in the text, thus making this a practical book.

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Practical Methods in Biochemistry

By Frederick C. Koch, Professor of Biochemistry, University of Chicago. 2d Ed. William Wood & Company, Baltimore. 1937. Price, \$2.25.

Complete revision of a very practical manual useful to every student of biochemistry to be used as a companion volume to a larger text. Students of biochemistry will do well to secure a copy.

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Refraction of the Eye

By Alfred Cowan, M.D., Associate Professor of Ophthalmology, Graduate School of Medicine University of Pennsylvania. Lea & Febiger, Philadelphia. 1938. Price, \$4.75.

The author, who has been teaching for many years, employs the theory of ophthalmic optics in such a way that the clinical aspects emerge logically and in orderly sequence from their bases of scientific fact. This book not only clarifies the subject of refraction but it will make far more effective the use of the various instruments and charts involved in this field. The 172 engravings and 3 colored plates supplement the text and add much to its value. The book opens with a thorough discussion of the fundamental physics of refraction and its application to the various lenses and to the normal and abnormal eye. The methods of determining the refraction of the eye and the management and optical treatment of ametropia are fully covered. The book is concluded by a study of contact glasses and of telescopic spectacles. This lucid presentation of a complex subject will be welcomed by students.

*Internal Medicine;
Its Theory and Practice*

Edited by John H. Musser, M.D., Professor of Medicine in Tulane University of Louisiana School of Medicine. 3d Ed. Philadelphia. Lea & Febiger. 1938. Price, \$10. An extensive revision of previous editions.

Among the more notable accretions are a new section on Haverhill fever, great alterations in the section on influenza, fresh material on undulant fever, tetanus, tularemia and new material on furunculosis, streptococcc meningitis and the treatment of streptococcal infections. The most recent developments of the treatment of metazoal diseases are included with much new material on the contagious diseases of childhood. The section on diseases of the heart has been thoroughly revised and material on gastroscopy, disorders of the duodenum, regional enteritis and peritoneal tuberculosis has been added. The endocrine gland section has been almost completely changed and a very complete exposition on the most recent knowledge of the gonads and the hormones that interrelate with them has been included. The contributors are all authorities pre-eminent in their fields and each writes from his experience as a teacher in an important medical school. The subject matter is restricted to the practical, the material is well organized and the text covers all of the latest important knowledge in internal medicine.

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more important features of the pathogenic and commensal micro-organisms along with the methods of bacteriologic diagnosis of the various infections. It is a real handbook for any medical student.

Materia Medica, Drug Administration and Prescription Writing

By Oscar W. Bethea, M.D., Professor of Clinical Medicine and Therapeutics, Tulane University of Louisiana. 5th Ed. F. A. Davis Company, Philadelphia. 1938. Price, \$5.

Every medical student should have this book. It is concise; covers the field with the fewest possible words although sufficiently descriptive; adheres strictly to the U. S. Pharmacopoeia and the National Formulary; is filled with good prescriptions and instructions on how to write a proper prescription "according to Hoyle." It is a veritable "mulum in parvo." Makes delightful reading because it gives so much instruction on *materia medica*, therapeutics, pharmacology and pharmacognosy. And it is inexpensive.

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*Alcohol:
One Man's Meat . . .*

By Edward A. Strecker, M.D., Professor of Psychiatry, School of Medicine, University of Pennsylvania, and Francis T. Chambers, Associate in Therapy, Institute of the Pennsylvania Hospital, Philadelphia. The Macmillan Company, New York. 1938. Price, \$2.50.

Presenting the psychology and the treatment of alcoholism. The illustrative case material is based on the authors' experience with alcoholics. The keenness of their perception and evaluation of this problem is demonstrated by the manner in which they weigh and evaluate the social, psychic and physical factors which constitute the syndrome of alcoholism. Good reading for him who is opposed to the use of alcohol and him who does not disapprove of it when used as he feels it should be used.

Handbook of Practical Bacteriology

By T. J. Mackie, M.D., Professor of Bacteriology, University of Edinburgh, and J. E. McCartney, M.D., Director of Research and Pathological Services, London County Council. 5th Ed. William Wood & Company, Baltimore. 1938. Price, \$4.

A serviceable, compact, handy book for the student. The subject matter is divided into three parts: I. General and Introductory; II. Bacteriologic and Serologic Technic; III. Describing the

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